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Washington Highlights

The Federal-State battle over title to submerged tidelands, much of which contains valuable oil-bearing lands, gets away to a running start during the coming several weeks with individual fights impending on two fronts. A final settlement of the question as to whether the states or the Federal government will get title to these lands is anticipated before summer arrives.

Meanwhile, this question appears to be almost certain to be injected into the coming Congressional fight on confirmation of the nomination of Edwin C. Pauley, wealthy California oil man, as Undersecretary of the Navy. Pauley has been under severe criticism for **alleged** attempts to use his official position in an effort to aid the states in their fight to retain title to submerged coastal areas.

The first move looking toward eventual settlement of the long-standing feud between Federal and state governments over ownership of the oil-bearing tidelands will come on January 28, when California officials go before the Supreme Court to file an answer to the pending suit, brought against the State last fall by the Department of Justice.

The original suit against California was filed against the State by Attorney General Tom C. Clark at the Direction of President Truman, and came after a similar suit against the Pacific Western Oil Corporation which was instituted in California, was withdrawn.

In the present case the government asserts the title of the Federal government to all submerged land along the coast of the state beyond the low water mark with the exception of harbors, bays and inlets.

This suit was filed directly in the Supreme Court as a case between sovereign state of the Union and the Federal government. The court gave California until January 28 to file its answer to the suit, after which arguments will be presented by State and Federal attorneys.

Attorney General Robert W. Kenny and Assistant Attorney General William C. Clary, of California, are scheduled to arrive in Washington on January 25th to submit the State's reply to the court.

Just a week after California's reply to the government's suit is due, the Senate Judiciary Committee is scheduled to open hearings on a bill, already approved by the House of Representatives, which would forever relinquish to the various states all claims by the Federal government to coastal areas from the shore line to the three-mile limit.

Secretary of the Interior Harold L. Ickes, who was wartime chief of the Petroleum Administration for War, has already opened an all-out fight on this bill, and "Honest Harold" is no mean opponent in any fight. Incidentally, Ickes will be the first witness before the Senate committee. Something Ickes may be asked to explain when he appears before the committee is his change in attitude. According to the record, a few years back Ickes repeatedly denied applications for licenses in the tidelands areas on the grounds that the states held title to the lands out to the three-mile limit.

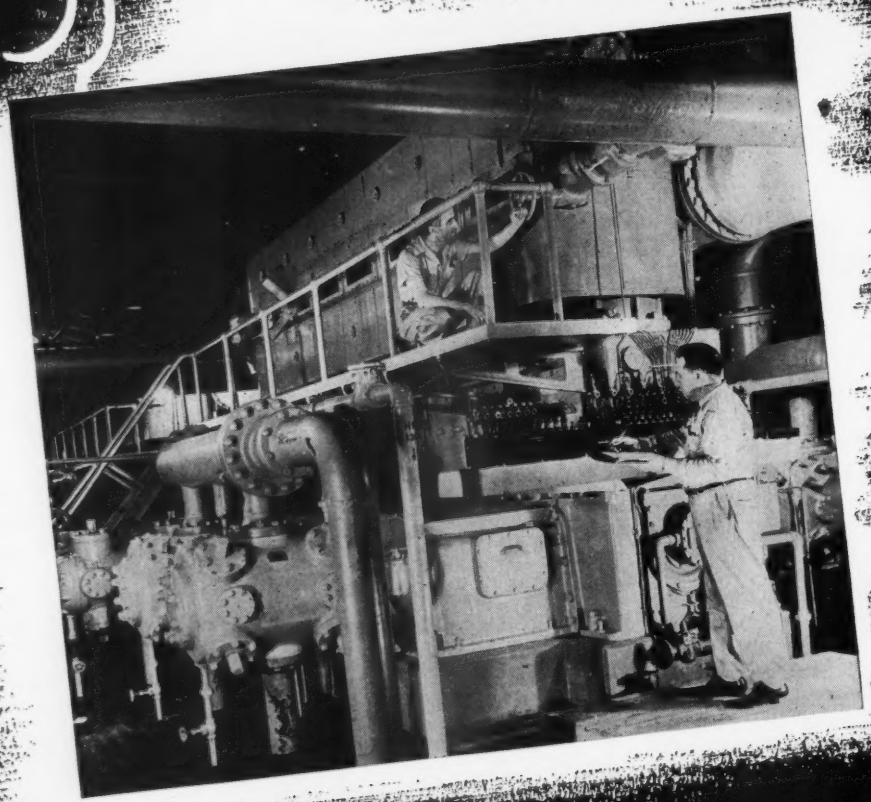
Kenny has been working tirelessly to weld together all of the state attorneys general into a pressure bloc with the hope and expectation of getting positive action from Congress on the bill confirming states' rights to offshore oil. He has been spectacularly successful in this effort. During hearings on the measure before the House Judiciary Committee, 46 of the 48 state attorneys general went on record in favor of the legislation.

One of Kenny's main contentions is that if the Supreme Court should rule in favor of the Federal government, it will mean the reversal of a long series of prior decisions in which the court has held that title to lands under water up to the three-mile limit belongs to the adjoining states.

In addition to the questions of law involved are the many political undercurrents within the administration. A southern California faction, headed by Representative Helen Gahagan Douglas, is bitterly op-

(Continued on Page 56)

Controlled



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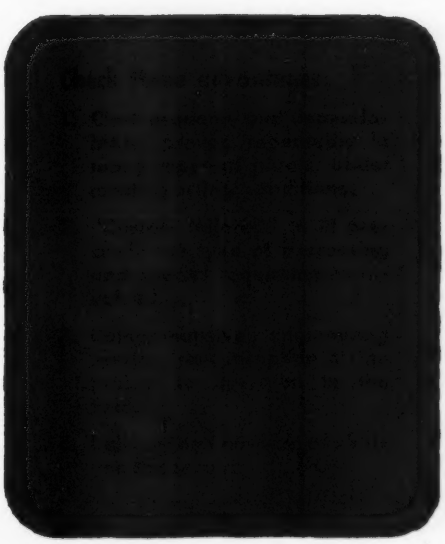

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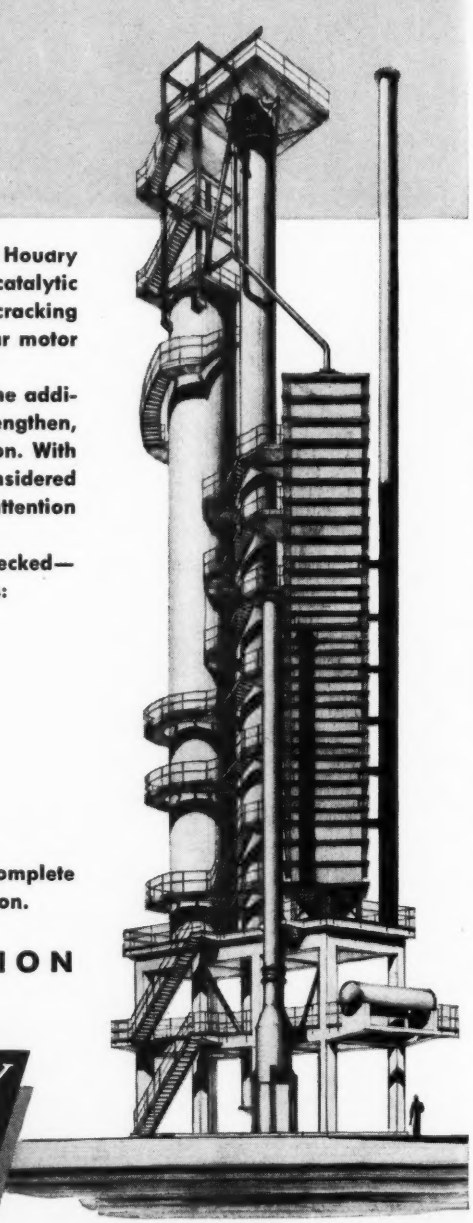

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Practical Refrigeration For Natural Gasoline Plants

By R. W. HEATH, J. B. TAYLOR, and P. W. HILL
Signal Oil and Gas Company

January Meeting

The advantages of refrigeration in natural gasoline absorption plant operations do not seem to be as generally appreciated as is justified. We are at a loss to understand the reason for this since refrigeration units have been used in a few natural gasoline plants for a number of years. The literature is also reasonably complete on the theoretical design (1) and advantages (2) of a modern unit. However it does appear that a more detailed study of the practical design, operating problems and actual data may serve to emphasize the value of refrigeration in a modern low pressure absorption plant.

In California there now seems to be a very definite interest developing in this type of unit. Possibly this is the normal reaction that may be expected as a result of the installation of at least three refrigeration units in existing low pressure absorption plants during the last year and the inclusion of such a unit in a new plant that is now being constructed. These existing refrigeration units have all proved extremely economical to install and are efficient and simple to operate. It is therefore natural that the interest in this type of operation will grow as this information is appreciated. For the same reason additional installations of refrigeration units should be expected in the near future. The writers have been directly interested in two of these recent refrigeration plant installations and their actual design and operation is the real basis of this paper.

We will limit our consideration to the use of propane as a refrigerant and to the application in low pressure absorption plants with absorber pressures of less than 100#/sq. in. Propane has the advantage of being inexpensive, readily available and of high refrigerating efficiency. Operating pressures are above a vacuum which precludes air contamination and all pressures allow reasonable pipe line sizes without serious pressure drops.

The advantages of refrigeration are not alone due to the reduction in vapor pressures but also the fact that the heavier fractions are reduced to a relatively greater extent than are the lighter hydrocarbons below the butanes. As a result there is a greater spread of vapor pressures between the various hydrocarbons at the lower temperatures. This results in better separation of the fixed gases from the fat oil tank and wherever colder temperatures are developed. An example of this condition is shown on the attached curve (Figure #1) showing oil temperatures against increased absorption below 80° F. in terms of increased oil rate to secure equivalent results. From this curve it can be found, for example, that by lowering the oil temperature from 80° to 55° F. that this is equivalent to a 50% increase in oil rate at 80° F. insofar as the butanes are concerned but only 35% for propane, 24% for ethane and 17% for methane. This advantage of selective absorption is not available by the other means of increasing plant capacity such as increased oil rate, lighter mol weight oil or increased pressures.

The costs of installing a refrigeration unit capable of subcooling the lean absorption oil by 25° F. are small in terms of equivalent oil rate and it would appear that such a unit might easily be justified in a new plant. This would be especially true where the volume of gas to be treated may be expected to remain relatively constant and the prospects of future additions to the plant to be unlikely. It is also true where poor conditions of atmospheric cooling are obtained which would require an oil circulation that could

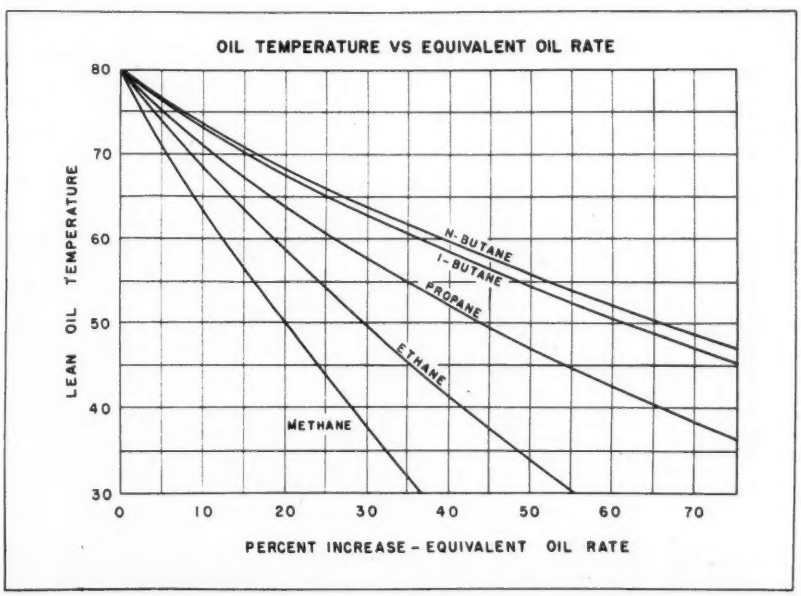

Figure No. 1—Data developed at 55# absolute and for an 80° F. base. Spread in effective vapor pressures can be shown as reciprocals of these values.

not be justified when compared with the corresponding costs of using a lower oil circulation and installing propane refrigeration to secure the same results. Where future expansion seems likely, it would appear reasonable to design the plant with the thought that refrigeration might be added later.

Benefits of refrigeration are more easily appreciated in existing plants where it is necessary to increase the plant capacity for the purpose of extracting additional light hydrocarbons or to regain a plant efficiency that has been reduced due to additional load. Under these conditions the costs of installing the additional equipment for the necessary oil circulation (and additional plant units) can usually be shown to be much greater than the corresponding cost of installing a refrigeration unit to accomplish the same results. In addition the actual installation of a refrigeration unit is a simple problem and can be accomplished without the usual interference with the existing plant units. Our studies indicate that the additional refrigeration to increase the plant capacity by 50% could be installed in our plants for about one half the cost that would have been required by a relative increase in oil rate.

In addition to the savings in first costs for a refrigeration system cooling the lean absorption oil, there is also a very definite savings in operating costs. The fuel requirements of a refrigeration system are practically limited to the engine fuel which is nominal, while the fuel required to both heat and pump increased quantities of absorption oil would amount to considerably more. Also the other operating and maintenance costs are low in comparison with the costs for the additional boilers, stills, pumps, exchangers and their auxiliaries.

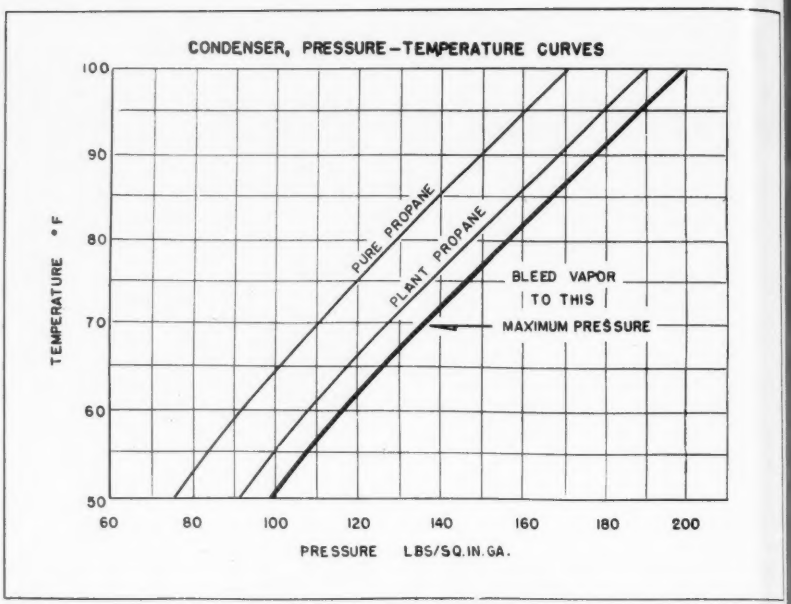

Figure No. 2—Curves indicate allowable pressures for a given temperature secured by bleeding light fractions from propane.

Refrigeration units can be designed to maintain minimum oil temperatures where the plant is overloaded and can utilize the lowest temperatures that can be secured in cold weather. Where the temperatures that can be secured under this arrangement are lower than necessary or where freezing or hydrate formation occurs, a back pressure valve, or temperature operated motor valve can be installed in the vapor line from the chillers. In cases where constant plant operating conditions are desired, a temperature controller on the oil will be useful. This may be especially true where the existing absorption plant is overloaded at some one point such as the stabilizer. In such a case a controlled oil temperature may help maintain uniform vapor volumes and quality of products that would smooth out these plant operations.

In fact the refrigeration unit complements the absorption unit unusually well since it supplies the maximum cooling when the atmospheric cooling is the poorest. When the atmospheric cooling is less efficient and the temperature of the lean absorption oil to the refrigeration system is relatively high there is an increased temperature difference between the oil and the propane that results in increased cooling. This additional cooling in turn increases the volume of vapors to be handled by the compressor and therefore raises the propane pressure and temperature but not sufficiently to entirely offset the increased cooling. The fact that the compressors are more efficient with a higher intake pressure is advan-

(TABLE #3)
PROPANE ANALYSIS

	"A"	"B"	"K"	"D"	"E"	"F"
ANALYSIS—MOL %						
Carbon Dioxide	2.10	0.30	7.00	0.00	0.15	0.10
Methane	7.35	0.51	14.41	0.00	0.19	Trace
Ethane	7.69	2.88	2.67	0.04	2.33	1.23
Propane	82.70	95.95	0.86	98.54	96.95	98.30
Iso-Butane	0.16	0.36	0.44	1.03	0.38	0.37
Normal Butane	0.00	0.00		0.39	0.00	Trace
Total	100.00	100.00		100.00	100.00	100.00
Specific Gravity	1.421	1.531		1.551		

REMARKS
"A"—Condenser Accumulator Vapor—172#/sq. in.abs. & 79° F.
"B"—Condenser Accumulator Liquid—172#/sq.in.abs. & 79° F.
"Plant Propane" before any bleeding—vapors to compressor.
"K"—Equilibrium Constants, "A"/"B".
"D"—Liquid in Chiller—lube oil removed.
"E"—Condenser Accumulator Liquid—162#/sq.in.abs. & 79° F.
"Plant Propane" after bleeding approximately 10% off "B".
"F"—**"Plant Propane"** from Signal Hill Plant.
Specific Gravity taken by Edwards Balance.
"A" to "D" samples secured at Huntington Beach before bleeding and "E" after bleeding.

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tageous to increased refrigeration. A compressor with clearance pockets has a still higher ratio of efficiency at higher intake pressure. The resulting lowered compression ratio allows its greatest advantage and maximum refrigeration at those times when the absorption plant, with its atmospheric cooling, is the least efficient.

The refrigeration unit supplements the absorption plant in still other ways that are important although not as generally appreciated. First, the fat oil entering the plant exchangers on its way to the preheater is proportionally lower in temperature as a result of refrigeration. This increases the mean temperature difference within the plant oil to oil exchangers and lowers the lean oil temperatures to the plant coils. As a result these coils are required to extract less heat and a closer approach of the lean oil to the water temperature is realized. This reduced lean oil temperature may be very appreciable in plants that are overloaded as is often the case when new refrigeration units are to be installed. On the other hand we have found relatively small increases in the heat load of the oil preheaters to the still.

Also the residual dry gas content, that is due to the vapor pressure of the light fractions in the lean oil, is reduced (3). With the lowered oil temperature and corresponding drop in vapor pressure, there is a smaller loss of gasoline in the dry gas. This same factor would allow the use of a lighter mol weight absorption oil and resulting increased aborption efficiency since complete stripping in the plant still is not as essential.

Still another advantage of refrigeration results from the lowered dew point of the dry gas and the reduced water vapor content. As a result there is usually no condensation in the dry gas fuel lines and this allows better performance through decreased pressure drops and reduced corrosion problems.

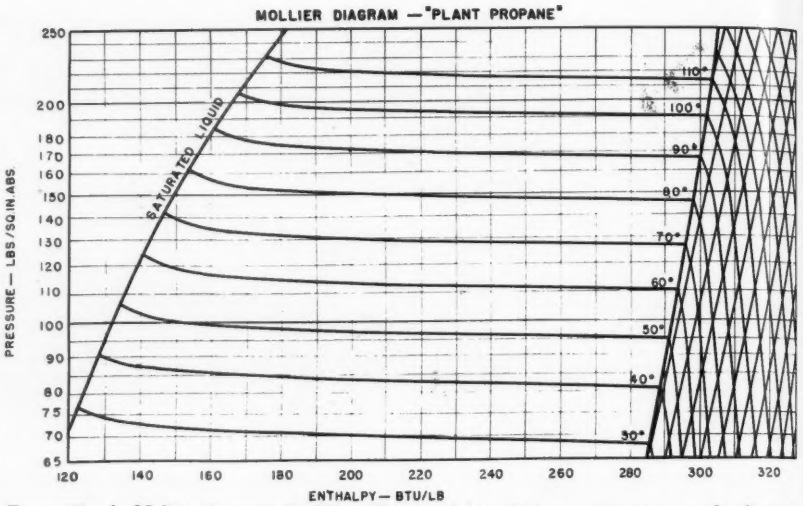

Figure No. 4—Mollier diagram for "Plant Propane" based on pure propane and adjusted for operating data.

Another benefit lies in the fact that propane liquid can easily be made available for other services. These may vary from laboratory refrigeration, to air conditioning, to overhead condensation in a stabilizing column or to wet gas cooling. Wet gas cooling is not too important in a low pressure plant since higher exchange rates can be secured on the oil side and it is generally economic to take the full subcooling at this point. However for maximum refrigeration wet gas cooling is definitely economic.

The process design of a refrigeration plant is fundamentally very simple. By the use of some practical data the operating conditions in a propane refrigeration plant can be found to a degree of accuracy well within the range of the basic assumptions of future operating conditions in the plant. We also believe that any natural gasoline plant can secure a satisfactory propane refrigerant from their plant.

When appreciable amounts of ethane and lighter contaminants are in the feed to the refrigeration system it is advisable to vent sufficient vapor from the condenser accumulator to bring the refrigerant down to a point of reasonable purity. This venting, or bleeding, is suggested in order to reduce the working pres-

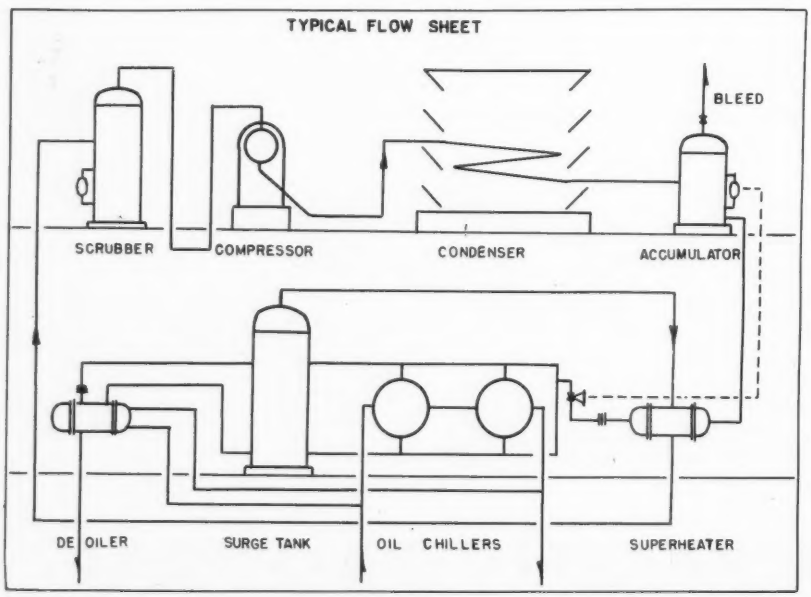

Figure 5

sures as well as the compressor horse power. By limiting the probable discharge pressure the compressor cylinder can be rated for greater capacity. Since the vapor to be bled is at the bubble point, it can be shown that relatively small quantities of vapor need be removed, with the best results secured by bleeding this equilibrium vapor slowly (see actual analysis data in Table #3). For any temperature, vapor should be bled until the pressure is reduced to its allowable maximum (Figure #2).

We call the propane refrigerant that reaches this vapor pressure limitation a "plant propane". This is the type of material under consideration in this paper. Unless the propane feed is consistently very pure, the "plant propane" should represent an average propane refrigerant.

Another point that is important in considering the use of "plant propane" is the fact that the light ends in this refrigerant are flashed upon expansion into the chilling unit at a greater rate than the propane itself. The bulk of the propane requires additional heat before flashing into the vapor phase. As a result there is a greater proportional circulation of these light ends than there is of the pure propane. In actual operation the analysis that is secured at the intake to the compressors will show more of these light fractions than will be in the average propane in the chillers or in the system (Table #3). The extent of this condition is dependent upon the relative volume of propane in comparison with the vapor space in the same system and to the rate of circulation of the refrigerant. A large system and a light load could easily result in a circulation of much higher percentages of light ends than would be secured at high circulation rates. The analysis we have used for "plant propane" takes into consideration the effect of the average rate of the circulation of these light ends and can be used for typical operations without unreasonable errors.

From these analyses, previous curves and data, a practical Mollier diagram has been developed (Figure #4) which has been adjusted for actual operating values. This enthalpy chart shows the amount of heat in a pound of the "plant propane" plotted against pressures, with lines of constant temperatures shown between the lines of saturated liquid and saturated vapor. These have been corrected for the light ends in the "plant propane" mixture so that they follow a curve of boiling points between the saturated liquid and vapor limits. From this diagram it is possible to determine the relative amount of heat and the pressures and temperatures that can be expected at any point in the operation. The diagram will show the amount of heat to be removed in the condensers, the effective cooling available in the chillers, the theoretical horse power of compression and many more important values. In fact, it will be the engineers' "bible".

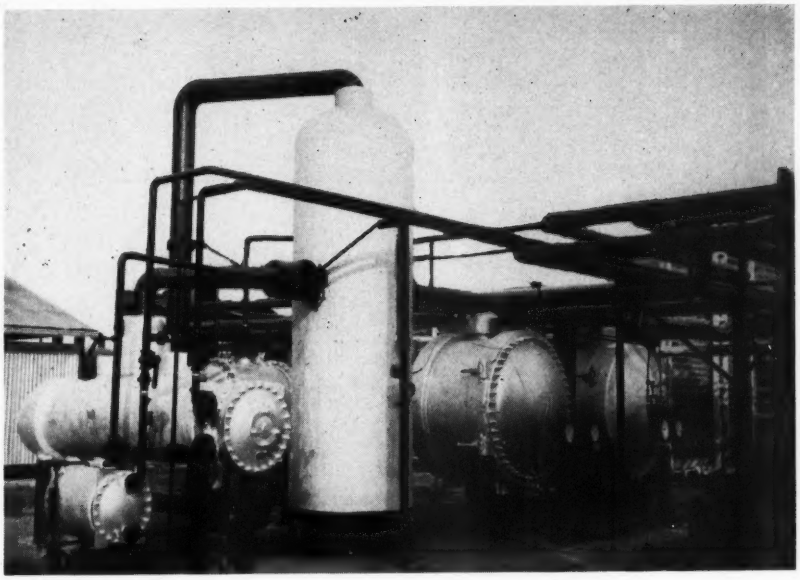

Figure No. 6—Signal Hill Refrigeration Unit
From right to left the units are deoiler, raw gasoline chiller, propane surge tank and oil chillers.

We are including a typical flow diagram for a refrigeration cycle on lean oil subcooling (Figure #5). This is offered as a guide to the general nomenclature and as a base for more detailed discussion on the design of various units. This flow diagram is not submitted with any recommendation that this arrangement is preferable to others. It is only one of several. For example, our condensers are fabricated pipe coils but actually open sections or a closed condenser would be just as suitable. Also, the run down accumulator can be designed for greater capacity and allowed to take any fluctuations in the liquid propane in the system. In such a condition the level control would be on the chiller unit instead of the accumulator. It is important to study the condenser under conditions of poorest cooling to determine the value of added surface against the horse power of compression. The Mollier diagram will show the temperature-pressure relationship in the condensers and the special curve (Figure #2) should show these values even more clearly. This change in pressure with the condenser temperature must be used in determining the relative values of added surface and additional compressor capacity.

Oil chillers are generally constructed in one of two types. First, a chiller without any vapor space in it which operates in conjunction with a surge tank. Second, a type with a vapor space that allows a level to be maintained within the unit. In either case the size of the chiller should be balanced against the compressor capacity since within reasonable economic limits the same cooling can be secured by either means.

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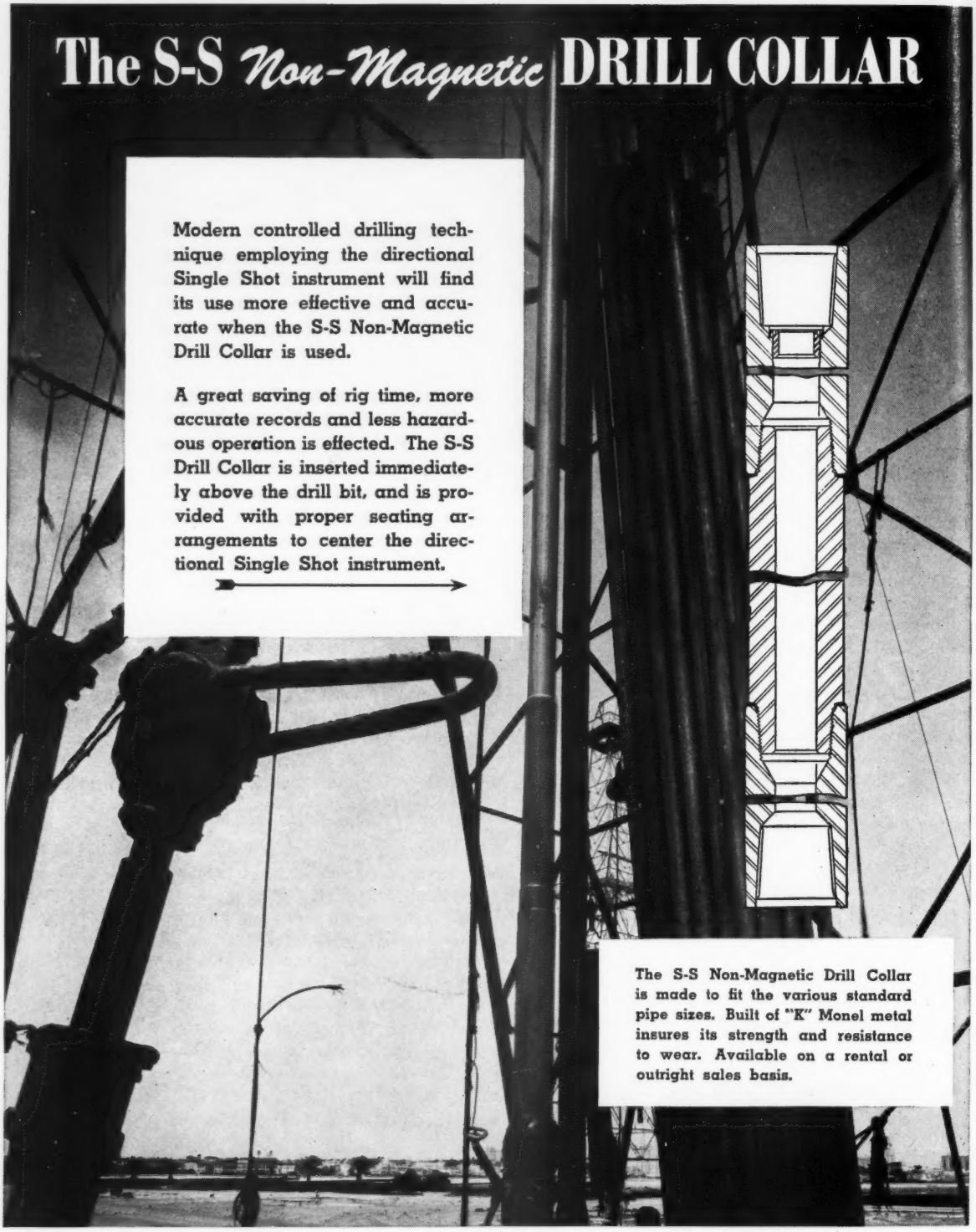

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pressor cylinders must be removed from the system before its volume builds up to the point that temperatures are affected or the liquid begins foaming. It is not felt to be economic to take any steps to remove the oil from the vapor at the compressor discharge since sufficient oil will probably get by and into the liquid propane to require its removal at this point. Actually a pure mineral lubricating oil offers no operating problem and a deoiler can easily be installed to accomplish its removal before any excessive concentration is possible. A side stream of the oil or other material to be cooled may be used for heating and since the cooling effect of the propane may be utilized there is no economic reason for not designing the deoiler rather liberally. It must be remembered too that the lube oil level must be kept low since the foaming oil will otherwise carry over with the vapors.

It is felt that the utility and the design of the superheater deserves more consideration than is generally accorded it. This unit not only superheats the vapor and prevents condensation during compression but at the same time the subcooling increases the refrigeration in terms of horse power per unit of cooling. With an impure, or "plant propane", there is an additional advantage that can be secured from this subcooling. A study of the enthalpy chart will show that subcooling the liquid will reduce the quantity of flash upon expansion and at the same time will also reduce the flash temperature of the "plant propane". If the chillers are designed to take advantage of this reduced temperature, and the increased temperature difference that can result, greater refrigeration can be secured without any change in operating pressures. This will increase the net refrigeration and offers some very interesting economic possibilities, especially if the available horse power assigned to this service is limited.

We believe that the complete unit should be designed for 250#/sq. in. or the equivalent working pressure required for "plant propane" storage. Safety valves will be set to work at this pressure but except for fire they should never operate. With this allowable working pressure even the engines can be shut down without the necessity of releasing any of the propane from the system. The knowledge that the failure of any of the controls, or of the compressors, cannot cause a hazardous condition to materialize, allows a very healthy feeling of security on the part of all concerned. The cost of this added safety is nominal.

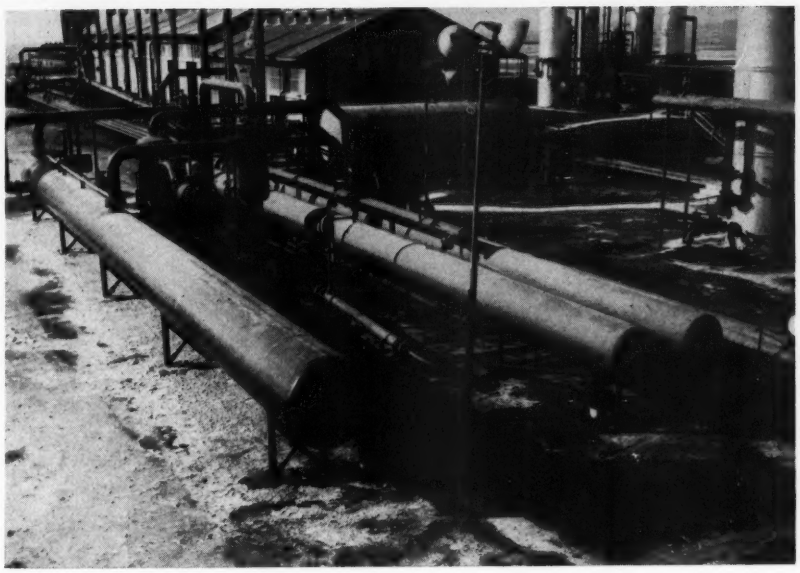


Figure No. 7—Huntington Beach Oil Chillers
39" x 65' unit at the left is the final oil chiller in series with the two 25" x 65' chillers on the right. The deoiler, superheater and scrubber are shown between the two chiller units.

Propane refrigeration units have been added to two of the Signal Oil and Gas Company's low pressure absorption plants during the last year. At Signal Hill this allowed one plant to efficiently handle the wet gas previously treated in two plants. At Huntington Beach this addition was required to allow the plant to maintain its efficiency with the increased volumes of wet gas to be processed. The two units are naturally somewhat similar in their flow (Figure #5) but differ considerably in their construction, especially in the case of the oil chillers (Figures #6 and #7). Both plants have chillers on the total plant production as it is being pumped into the raw feed tank for the stabilizer. In addition, the Huntington Beach plant has a chiller on the natural gasoline and uncondensed vapors from the still run down condensers (Figure #10).

Both plants better their estimated performance and have provided no unforeseen operating problem or hazard. In fact, the only unusual condition that we have had in a year of operation was the result of the failure of the air supply to the level control on the accumulator at Huntington Beach. This allowed the motor valve controlling the expansion of the liquid into the chillers to stand wide open and allowed all the liquid and a relatively small quantity of the vapors to pass into the chiller. The result was a small increase in the vapor load to the compressors and a decrease in the compressor discharge pressure of a few pounds, since full condensation was not required. The higher propane pressure in the chillers raised the oil temperature a few degrees but not enough to upset the plant operation and no hazard resulted from this failure.

A set of operating and performance data for both plants is included (Figure #11). In general these are in good agreement with the Mollier diagram. For further comparison a set of the enthalpy data for Huntington Beach is given on the following page.

COMPRESSION	
Inlet vapor—94# Abs. & 61°	296 BTU/#
Discharge—174 Abs. & 125°	309 BTU/#
Work of Compression	— 15 BTU/#
CONDENSATION	
Inlet 173# Abs. & 117°	313 BTU/#
Outlet 171# Abs. & 85°	157 BTU/#
Heat of Condensation	156 BTU/#
SUPERHEATER	
Liquid in 171# Abs. & 85°	157 BTU/#
out Sat. liquid & 80°	153 BTU/#
Subcooling	4 BTU/#
REFRIGERATION	
Liquid in 98# Abs. & 48°	153 BTU/#
Vapor out 98# Abs. & 53°	292 BTU/#
Net Refrigeration	—139 BTU/#

The data taken from the Mollier diagram agrees with the actual test data very closely except for the compressor performance. In this case the Mollier diagram gives a 108° F. discharge temperature while it was actually 125° F. Also, the 15 BTU/# for the theoretical work of compression is too low a value. Both differences are due primarily to the fact that our intake and discharge pressures are secured from pipe line connections. Actually the pressure losses through the compressor valves will result in a lower intake and a higher discharge pressures within the cylinder and therefore a greater ratio of compression and increased theoretical horse power. Since the ratios of compression for this work are generally about 2.0, or less, a small change in either pressure can result in a relatively large percentage increase in horse power. Also, the jacket cooling water is generally warmer than the propane to the cylinder and therefore gives up heat in the cylinder and heats rather than cools the vapor.

This difference in readings is typical and must be considered in any design before any value is accepted for the compressor horse power.

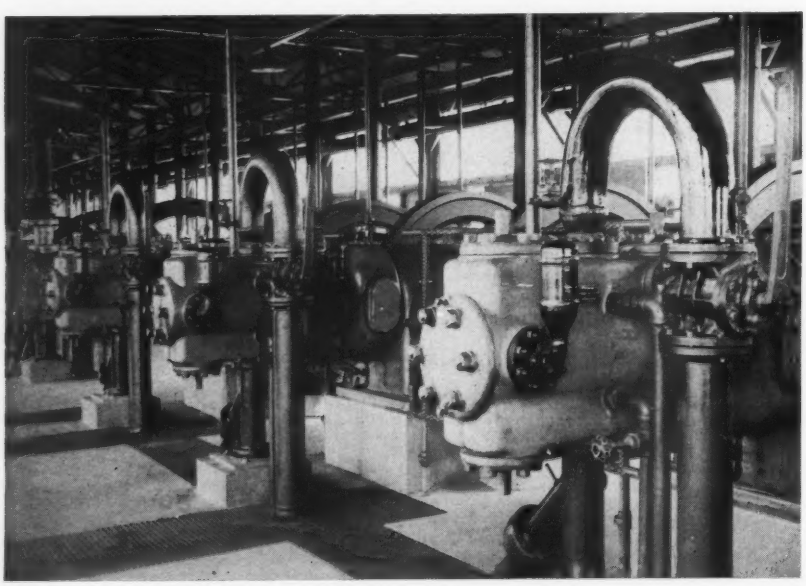


Figure No. 8—Huntington Beach Propane Compressors

The actual horse power required to compress propane is less than generally required for natural gases due to the relatively low ratio of specific heats (1.17). For this reason one of the more generally accepted curves of horse power per 1000 Mcf/day for different ratios of compression, can be used (4) or any other curve or empirical data with which you are familiar and can interpret for this type of service.

Continuing with our discussion of our actual operating and design data, there are several other points of interest in connection with the compressors. These include the use of a non-return or a check valve which should be installed on the discharge of the compressor. We also feel it is better to install the compressor intake line so that it rises and makes a 180° bend with the shut off valve on the riser. This reduces the possibility of liquid accumulating above the intake valve during periods when the compressor is down (Figure #8). In cases where the shut off valve must be placed in a position that would allow the accumulation of liquid between the valve and the header it is very important to install a bleeder that will permit complete drainage of any liquid before the engine is started.

We believe that there are a number of advantages favoring the use of a slightly oversize compressor cylinder and then bringing it down to the desired operating range by the use of clearance bottles. The most important of these advantages is the flexibility that is offered. This not only allows the correct capacity for the calculated design conditions to be secured but will allow a clearance adjustment to be made at any time to meet further or changed operations over a wide range of conditions. Also, Clearance pockets have less effect on the cylinder capacity at low compression ratios such as exist under the higher intake pressures and higher loads. For this reason when the atmospheric cooling is the poorest and the chillers are producing the greatest cooling effect, the compressor cylinders are handling this increased volume of propane with the highest relative efficiency. This is an ideal situation

since it allows the greatest load to result at those times when the value is greatest and higher horse power can be justified.

The condensers in our plants are pipe coils designed for the necessary drainage to handle full condensation without unnecessary pressure drop. It can be seen from the Mollier diagram that there will be a relatively large mean temperature difference (MTD) between the cooling water and the propane except for the last ten percent, or less when the "plant propane" temperature curve swings up as a result of the light hydrocarbons which reduces the temperature difference very materially. Actual test data indicates that half the heat of condensation was done in the first 30% and two thirds in 50% of the coil.

In the Huntington Beach plant the oil chiller was designed to utilize the range in boiling temperatures available in a "plant propane" at a constant pressure. The oil chillers at this plant consist of one 39" x 65' and two parallel 25"x 65' long units in series flow. The propane is expanded into one end of the 39" chiller and travels the length of this unit before it overflows a weir that maintains the level of the propane and flows into the other chiller. The chillers are piped for counter flow. The propane temperature increases about 5° between the point of expansion and the end of the chillers.

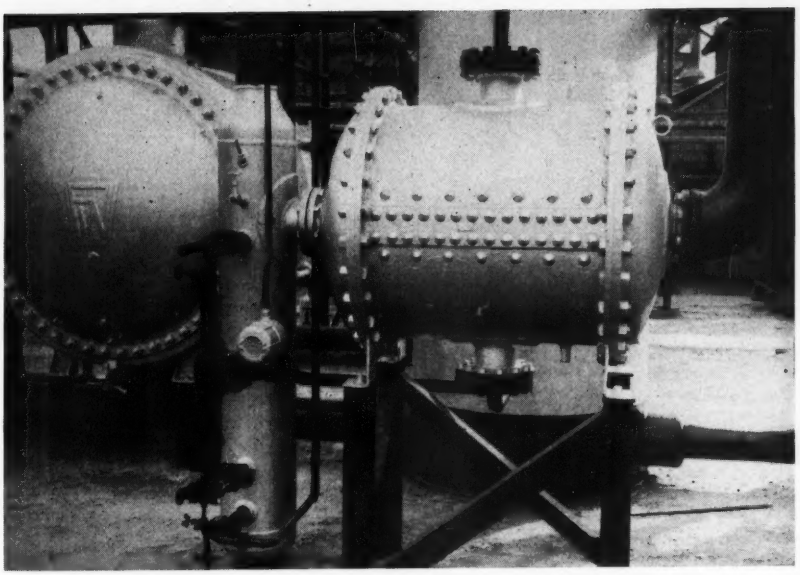


Figure No. 9—Signal Hill Superheater and Scrubber
The surge tank actually serves as a scrubber in this plant so that this unit serves as a means of installing a float and the magneto ground.

These changing temperatures can be checked on the Mollier diagram and are obviously worth consideration as a means of increasing the M.T.D. and therefore the actual cooling. You will note in the operating data that our final oil temperature is 53° which is the same as the final propane temperature. The initial, or flash, temperature of the propane is 48° F.

These chillers at Huntington Beach make use of standard 1" pipe for tubes and were fabricated in place. These pipe tubes were placed in the lower two thirds of the shell which leaves the top third for vapor space. We also utilize these oil chillers for the small amount of working storage that is necessary to avoid adding propane more often than necessary. The minimum level of propane for efficient operation is indicated by a super-heating of the vapors as a result of the direct contact with the tubes as the level drops too low. This minimum efficient level can be determined definitely if thermometers are installed in both liquid and vapors. This will then give a reliable minimum level that can be indicated by a gauge glass reading during normal operation.

At Signal Hill, commercial exchange units were installed. They have performed as well as could be desired. However, with this type of design, which is very similar to that shown in the flow diagram, there is no means of taking efficient advantage of the lower flash temperature and slightly greater surface is required for the same refrigeration. The economic choice between these two types of cooler will depend upon individual conditions and this can be decided after considering both possibilities.

The deoiler must secure its feed

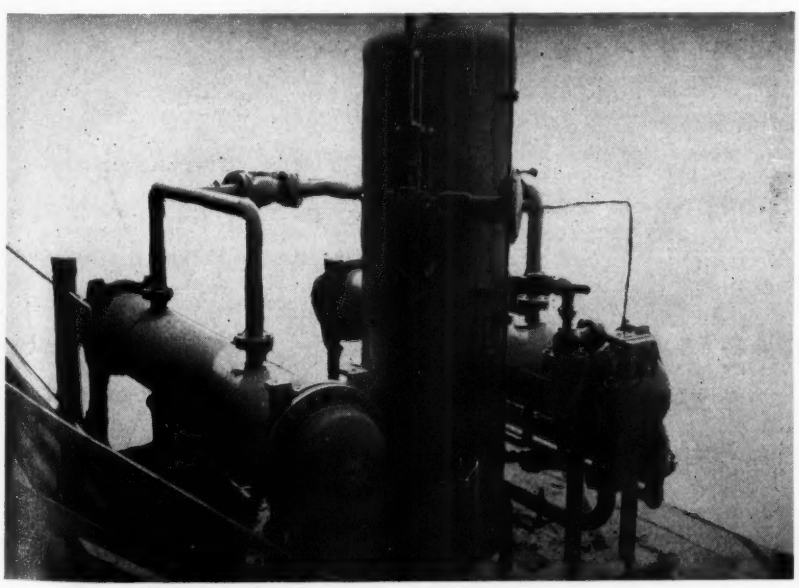
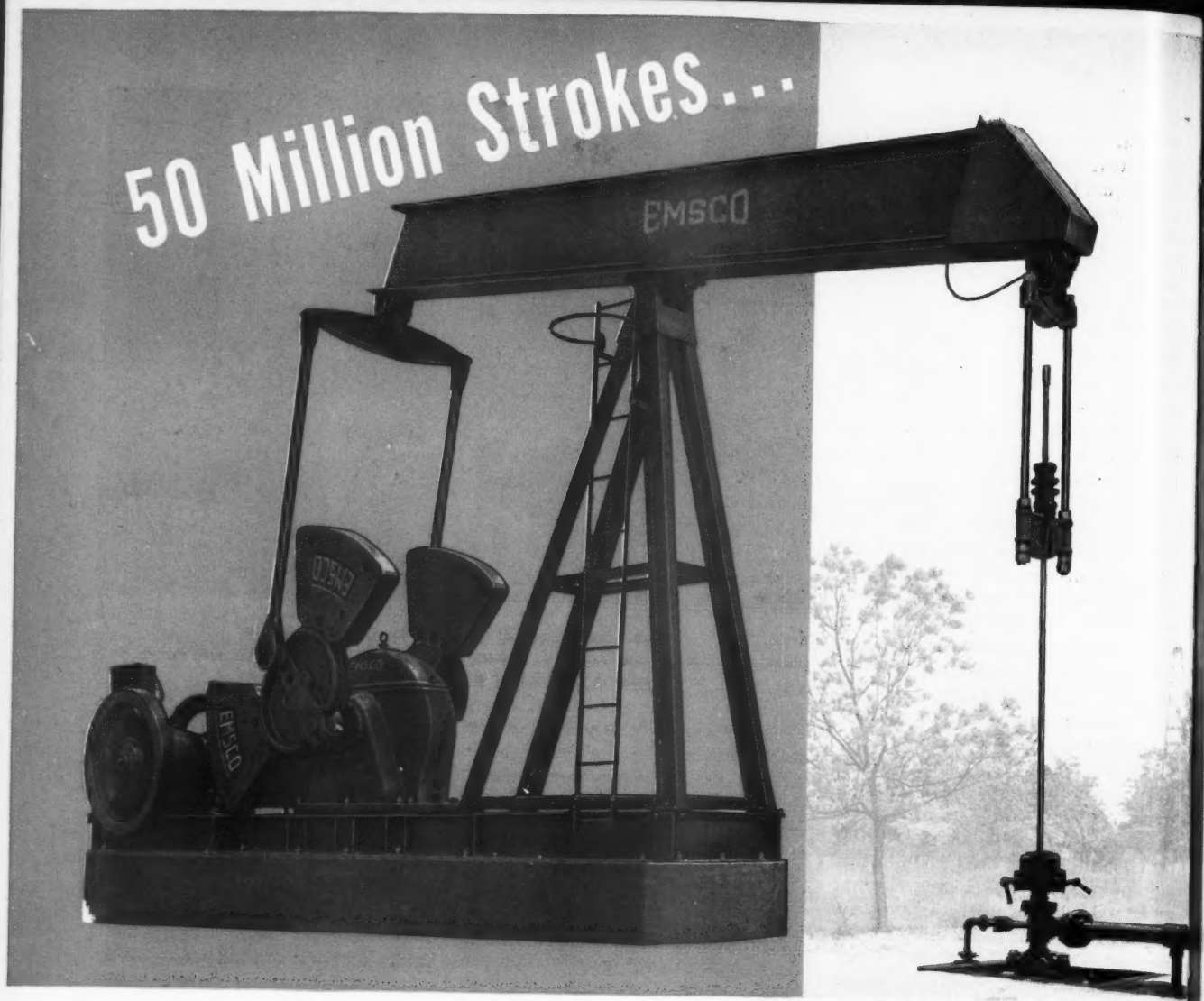
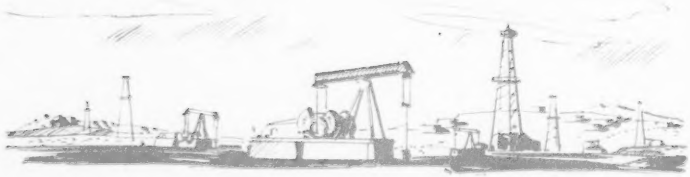


Figure No. 10—Huntington Beach Gasoline Chillers
Note separate surge tank and level control for semi-independent operation.



...is only a part of a lifetime



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from the point where there will normally be the greatest concentration of lubricating oil in the system. At Signal Hill where the propane is in constant circulation the supply is taken from the surge tank. At Huntington Beach the propane enters at the end of a long horizontal chilling unit and flows lengthwise through this unit. For this reason the lubricating oil will become concentrated at the end of the unit and the feed for the deoiler is taken from this point of greatest concentration. In this plant where the design allows the lubricating oil to concentrate within the system, the problem of removing the oil is obviously simplified.

To further describe the units, at Huntington Beach we have chillers on both our run down gasoline and uncondensed vapors and on the raw production into the stabilizer feed tank (Figure #10). These units are independent of our oil chillers and are located in another area of the plant. Both are converted exchanger units and are connected top and bottom to a propane surge tank. A level control on the surge tank maintains an independent level in this tank. A small drain line to the deoiler is used to remove the lubricating oil that concentrates in this unit.

The chiller unit on the run down liquid and uncondensed vapors from the still condenser is used to control the volume of vapors which must be handled by the vapor compressor. The other chiller unit is on the plant production to the stabilizer feed tank and in this case the cooling permits a lower pressure for separation of the excess light fractions. This lower temperature allows a better separation of the light hydrocarbons because of their relatively smaller reduction in vapor pressure at these colder temperatures (5). The amount of cooling on each chiller is regulated manually by an occasional adjustment of the valve on the vapor line out of the exchanger and into the surge tank. It has been found that very even control can be secured by this means and the back pressure valves or controllers were not necessary. The addition of these two chillers allowed us to continue with the same vapor compressor as existed in the plant before the addition of the refrigeration unit and the resulting increased extraction of light hydrocarbons. It was found that the refrigeration horse power necessary to reduce the vapor volume and lower the discharge pressure is approximately 60% of the horse power that would have been required to handle the additional vapors without this refrigeration. The additional 40% of the horse power is available for additional refrigeration. There has been no problem in connection with this operation.

Figure #11
OPERATING DATA

	Signal Hill	Huntington Beach
General		
Oil Rate—1000 Gals/Day	585	1,110
Natural Gasoline—Gals/Day	28,500	45,500
Propane Refrigerant		
MCF/Day	3,260	5,520
LBS/Hr.	15,800	27,000
Gal/Min.	62	105
Condensers		
Surface (O.D.)—Sq. Ft.	3,670	5,810
Pressure —in	152	173
—out	148	171
Temperature —in	106	117
—out	76	85
Superheater		
Surface (O.D.)—Sq. Ft.	385	250
Temperatures		
Vapor —in	46	53
—out	58	60
Liquid—in	76	85
—out	67	80
Oil Chillers		
Surface (O.D.)—Sq. Ft.	2,660	7,650
Propane—Gal/Min	.....	93
Pressures		
Oil—in	92	72
—out	84	65
Chiller	88	98
Temperatures		
Oil—in	74	73
—out	49	53
Propane—Flash	..	48
—Final	..	53
—Surge	46	..
Gasoline Chillers		
Surface—Sq. Ft.	450	450
Pressures		
Gasoline—in	105	105
Propane	88	105
Temperatures		
Gasoline—in	87	82
—out	63	60
Propane	46	55
Compressors		
Pressures		
Intake	87	94
Discharge	152	174
Compression Ratio	1.75	1.85
Temperatures		
Intake	58	61
Discharge	113	125
Engine cooling water	110	110

Remarks
One third additional compressor capacity is being installed at Huntington Beach.
Pressures given in #/sq. in. absolute and temperatures in degrees Fahrenheit.

Conclusion

In conclusion, we are firmly convinced that refrigeration can be justified in a new low pressure absorption plant in cases where the future maximum volumes of wet gas are known within reasonably close limits, or where the atmospheric temperatures and humidity are too high to allow efficient atmospheric cooling. We realize that refrigeration is also justified in many high pressure operations but we have limited this paper to low pressure absorption where the advantages to be gained are probably more pronounced, due primarily to the fact that a greater cooling range is possible without danger of hydrate or ice formations.

The use of refrigeration is also felt to be the simplest, cheapest and

(Continued on Page 55)

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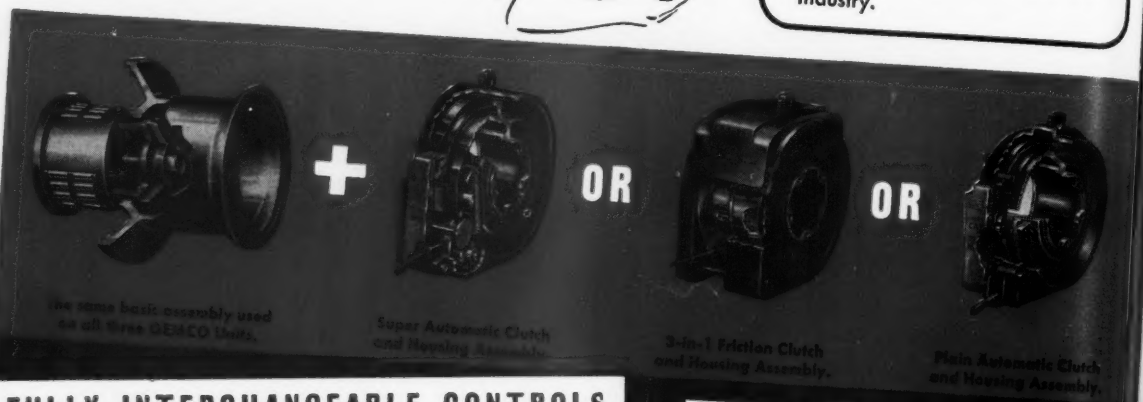
FIRST *In the World to Offer*

The GEMCO Engineering and Manufacturing Organization has been in continuous existence since 1917. GEMCO designed products are in service throughout the world.

LOOK TO GEMCO FOR NEW DEVELOPMENTS

Years of normal improvements combined into one outstanding engineering and standardization development, make GEMCO Catheads the standard of the Oil Industry.



The same basic assembly used on all three GEMCO Units.

Super Automatic Clutch and Housing Assembly.

3-in-1 Friction Clutch and Housing Assembly.

Plain Automatic Clutch and Housing Assembly.

FULLY INTERCHANGEABLE CONTROLS AND ANCHOR NOW STANDARD EQUIPMENT ON ALL GEMCO CATHEADS

A choice of hydraulic, pneumatic, steam or mechanical operating control is available for all models. All controls are securely attached to and form a part of the anchor assembly as shown above. This unique and exclusive design permits changing from one Cathead to another without disturbing the control or anchor.

Complete field installation may now be accomplished in a matter of minutes by the use of our exclusive installation fixture. No measuring, no drilling, no tapping.

GEMCO SHAFT ADAPTERS

Used for adapting any one of the new GEMCO Catheads to any size or type of lineshaft are a part of the basic assembly and form the inner race for the large twin Roller Bearings. Cathead may be mounted close to the drawworks or by using the extended shaft adapter Catheads may be mounted any desired distance away. Once an adapter is keyed to the shaft it need never be removed. Any of the new model GEMCO Catheads may be mounted on the same shaft adapter thus permitting complete interchangeability of all GEMCO Units.

CONDENSED SPECIFICATIONS

	Super Automatic A-5	3-In-1 Friction B-5	Plain Automatic C-5
Uses	Breakout	Breakout & Spinning	Breakout
Type of Clutch	Positive Actuator	Expanding Friction	Positive Shoulder
No. of Drum Revolutions to Break Joint (42" Stroke)	20° Less Than 1 Rev.	2 or 3 Optional	20° Less Than 1 Rev.
Stroke of Jerkline	42"	Not Limited	42"
Distance Catshaft Bearing to Jerkline (Overhang)	4½"	3"	5"
Housing Max. Dia. & Cathead Overall Length	20" x 20"	20" x 23"	19" x 20"
Std. Max. Bore	6" Straight 6½" Taper	6" Straight 6½" Taper	6" Straight 6½" Taper
Net Weight	395 Lbs.	440 Lbs.	380 Lbs.

GEMCO COMPLETES 19th YEAR AS CATHEAD DESIGNERS AND BUILDERS

Since 1926 GEMCO has built and delivered to oil fields throughout the world more than 3,000 Catheads. In 1937 J. H. Schreiber, now president of GEMCO, designed and patented the first fully automatic light impact type Breakout Cathead. Immediate universal acceptance was indicative of its outstanding merits. In 1946 GEMCO continues to lead by offering this same fine product with many important improvements together with two other excellent models.

a Complete Line of Breakout & Spinning CATHEADS OF ALL POPULAR TYPES!

STANDARDIZE WITH GEMCO

You may now select your favorite type of Cathead from our complete line of 1946 Models. GEMCO Engineered and Standardized Catheads offer greater safety, dependability and lower maintenance costs.

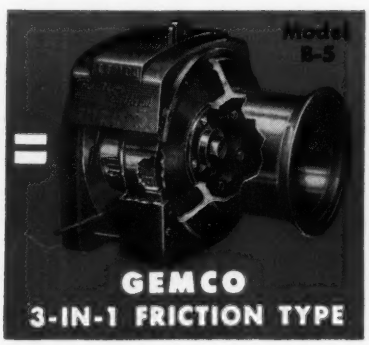
FOR THOSE who want the dependable fast action of our popular fully automatic, positive clutch type, we still recommend our greatly improved GEMCO Super Automatic.

GEMCO
SUPER AUTOMATIC

This Super Automatic is the result of many years of engineering research and development. Its popularity has steadily increased since it made its first appearance in 1937. Now with its many important improvements for 1946, even a higher standard of operating efficiency is assured. Besides the exclusive GEMCO interchangeable features, it now has an improved one-piece Jerkline drum that lasts longer, a safety Jerkline shoe that can now be removed and replaced in less than a minute. Other improvements include new ratchet type operating mechanism that eliminates accidental repeat operation even when operator does not release control.

Improved Actuator (Clutch Pin), with new lock type engaging mechanism that prevents any possibility of partial engagement or disengagement.

IF YOU PREFER the slower action of a friction clutch type, you will welcome the many outstanding advantages offered in our Breakout, Spinning and Combination Make & Break, The Gemco 3-in-1 Friction Cathead.



GEMCO
3-IN-1 FRICTION TYPE

This Model can be used for joint breaking, spinning, tonging or as a combination breakout and spinning Cathead. A three-purpose unit that can be used on either side of the drawworks, or mounted "inside" between lineshaft bearings. To change from breakout to spinner you only change the line in less than one minute. Extremely low Jerkline speed controlled to give a Jerkine stroke of 42" in either 2 or 3 lineshaft revolutions, as desired. Large, expanding type Friction Clutch of time-tried design with power to break the toughest joints with ease. It is easy to operate. No toggles, no thrust bearings, no clutch adjustments, no end thrust on lineshaft. Has large drum for wire line and minimum overhang. (See Specifications).

AND IF YOU WANT a low cost utility joint breaker that is designed to set a new standard of operating efficiency and low maintenance cost for a Cathead of this type, we offer the GEMCO Plain Automatic.

GEMCO
PLAIN AUTOMATIC

The Plain Automatic has the lowest Jerkline speed of any Cathead of this type. Long stroke, small drum diameter. Provides positive shoe engagement without shock to operator. Employs hard, alloy steel Engaging Shoulders that are inexpensive and can be replaced in a jiffy without dismantling Cathead—no expensive welding of worn drum shoulders! Disengaging Cam moves shoe outwardly with minimum impact. Shoe is released automatically when joint is broken. When not in operation the shoe is latched in its disengaged position to prevent accidental engagement.

Large twin Roller Bearings the same as are used in the Super Automatic reduce friction to a minimum and increase operating efficiency.

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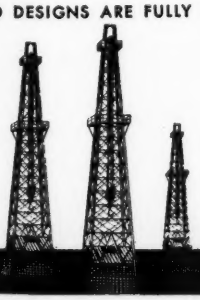

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MODERN EQUIPMENT FOR THE OIL WELL DRILLING INDUSTRY

Mud Programs and Properties of Drilling Fluid

The general characteristics of drilling mud were discussed in a previous issue of this magazine.* While the specific characteristics of the mud can be changed to meet conditions as they are encountered (assuming that the mud at all times is basically in good condition) it is always advisable to plan the mud program in advance to the greatest extent possible. Quite evidently subsurface conditions cannot always be foretold, epecially in exploratory drilling, nor can the degree to which an expected adverse condition will affect the mud be predicted with certainty. For example, a high-pressure flow of salt water may be expected at a certain depth; but it may be encountered higher than expected or it may be greater than anticipated. Contingencies may therefore have to be met with quick action; but this does not preclude the advantage and economy of laying out a mud program based on all the available data. Moreover, contingencies in areas where troublesome formations are known to exist are usually exaggerations of adverse conditions rather than unexpected emergencies and if their existence has been planned for, their exaggerated effort can generally be overcome with little difficulty.

In planning a mud program all available data should be used to determine what conditions must be met. In exploratory wells these data will generally be meager; but what information can be furnished by the geological department which selected the location should be given thorough consideration. In wells drilled for the development of a proven field, the subsurface information will almost always be comprehensive and can serve as a guide for a general mud program. Each well, however, should have its own specific program based on the general program but taking into account any peculiar conditions encountered while drilling. In redrilling operations or any workover jobs, the well history is available and important in this is the production data that discloses the existing formation pressures. Any mud covering oil zones that are to be returned to production must be of such quality that it will not injure a zone which is partially depleted.

Special characteristics must often be given to the mud fluid when performing certain operations. Coring can be greatly influenced by the mud being used and precautions should be taken to make sure the samples of formation obtained are affected by the mud to the least degree possible. The mud used when drilling through an oil sand should be especially conditioned for that purpose; infiltration of water from the mud fluid has injured many a productive zone. Cementing is frequently influenced by the mud used while drilling and cement failures are sometimes the direct result of the previous circulation of poor mud.

Increasing the weight of the mud to offset high formation pressures as the well progresses should be done gradually. Formations that will take the heavy mud which is necessary for drilling below them may have to be cased off. It has been found, however, that in some cases the use of a mud having an extremely low water loss and that forms a very thin mud cake will seal off the upper formations to such an extent that the required weight of mud can be used without casing off the formations above. Opposite conditions are sometimes encountered where casing has been used to shut off a shale body that caves with low weight mud. By using a heavy mud with low water loss, the caving shale has been held in place and a string of casing saved.

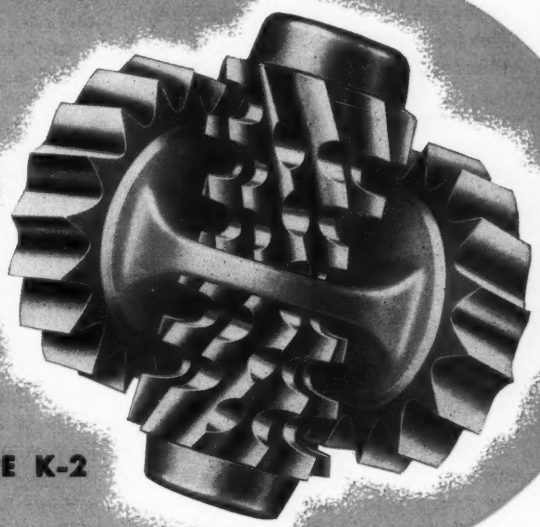
General mud programs previously established for a field may thus be revised with advantage by careful study of the conditions encountered. But regardless of the program, the mud must be kept in condition at all times to make sure that it has the properties it must possess to meet completely the existing requirements. Constant testing is necessary and the addition of ingredients such as weight material, colloidal materials or chemicals may frequently be necessary to keep the fluid in proper condition. Both in original mixing and in conditioning, the introduction of admixtures or chemicals should be done slowly so as to

Taking sample of mud for testing Standard Oil Co. of Calif. deep test at Coles Levee.

H C Smith

FORMATION PROVED

ROCK BITS



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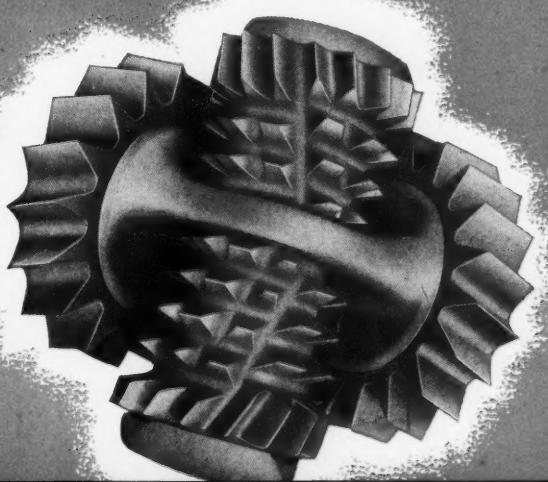


TYPE 6

keep the circulating stream in balance; that is, so that the entire mud system will be thoroughly mixed and have the same characteristics throughout.

The weight of the mud and the pressures that different weights exert at different depths have been discussed in the article previously mentioned. Further discussions of the fundamental principles of other characteristics will here be given.

Water Loss and Wall Building Properties

The value of low-water-loss muds is generally acknowledged by everyone having anything to do with the drilling of oil wells. Water loss is the filtration rate of a mud fluid and is the measure of the amount of water allowed by the drilling fluid to pass through a porous medium. The standard A.P.I. measurement of water loss or filtrate is the amount of water that has passed through a Watman 50 or 52 filter after a period of 30 minutes from a verticle cylinder with a diameter of 3 in. plus or minus 0.7 in. and height of 5 in. plus or minus 0.25 in. (containing approximately 600 c.c. of the fluid being tested) under a pressure of 100 p.s.i. plus or minus 5 p.s.i.

Water loss and cake thickness constitute the determining factors of the wall building property of the mud. It is very desirable that the mud will form a thin and impervious cake on the wall of the well and that it form this cake as rapidly as possible. When this cake is formed it will seal off the formation and prevent further loss of water from the fluid into the formation. A mud with good wall-building properties is therefore one that will form a thin filter cake on the wall of the well and is consequently one with low water loss characteristics.

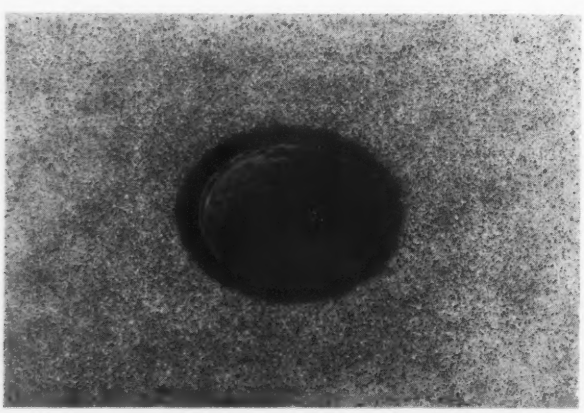
The wall-building property is dependent upon the amount and physical state of the gel-forming colloidal material in the mud. In contrast to a mud of high wall building properties, a mud that is low in colloids and high in inert solids deposits a thick filter cake on the wall of the well. A thick cake reduces the diameter of the hole and this reduction may be to such an extent that it will interfere with the passage of tools or other equipment being run in the well and may later cause difficulty when running casing. A thick cake is more easily knocked off the wall of the hole by bits or other tools than is a thin cake and this removal of the seal on a porous formation may cause trouble. A disadvantage of a thick cake that is often serious is that it is generally tenacious and hard to remove. It is thus a hazard when cementing and may cause failure of the cement job by preventing a proper bond between the cement and the formation or it may cause channeling, or both.

Although tests for wall-building properties do not give the concentration or state of the collodial material in the mud, an inspection of the cake thickness and water loss does disclose whether or not the colloidal content is sufficient and whether it is in such physical and chemical condition as to give good performance in the well. If the wall-building properties are bad it will be evident that other tests should be made and remedial measures taken to put the mud in proper condition.

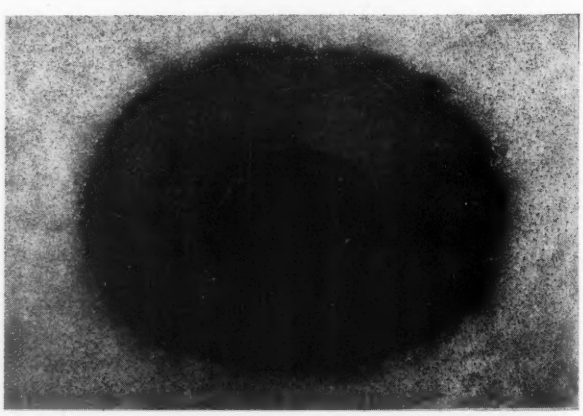
Water loss, while a factor of the wall building properties, must frequently be given individual consideration when the mud is to perform some specific task during the drilling operation. The use of colloidal clays and chemicals has been very effective in compounding drilling fluids with low water loss but the addition of an organic colloid to the mud has recently been the means of reducing the water loss of a clay base mud to 1 cc. or less where the requirements have been such as to make this minimum desirable. With colloidal materials and chemicals available, it is thus possible to reduce the water loss of a clay base mud to any amount necessary for the particular task for which it is to be employed if the base mud is of a quality suitable for treatment and if the other characteristics which affect the wall-building properties, such as viscosity, are controlled.

While an increase in pressure will tend to increase the water loss, the actual increase due to pressure will usually be small. It appears, however, that the character of the base mud has a definite influence on the increase in loss of water by increase of pressure. A mud having a high concentration of colloids derived from the addition of prepared bentonite will be but slightly affected by pressure.

An increase in temperature also causes an increase in water loss and



(Left) Section of an 8½" hole showing thin cake and the slight infiltration of water by use of Aquagel-water mud.



(Right) The mud cake here formed when using a native clay mud has reduced hole diameter and water has permeated some distance into the formation.

in general there are also variations in effects due to the character of the base mud. Viscosity, however, is a factor in the increase in water loss caused by high temperatures since temperature flocculation is sometimes the major cause of decreased wall-building properties under elevated temperatures. Extremely high temperatures applied to drilling fluids have been found to result in the destruction of colloidal properties; but the bottom hole temperatures encountered in oil wells will seldom, if ever, be high enough to bring about this effect. It must also be remembered that the mud fluid during circulation in the well will not reach the same degree of temperature as the bottom of the hole. High concentrations of prepared bentonite added to the base mud have resulted in causing a smaller increase in water loss due to a temperature but as long as considerable amounts of bad wall building ingredients of the base clay remain in the mud, the adverse effect of these ingredients will persist to an extent approximately proportional to their quantity.

Both the temperature to which the mud will arise and the pressure to which it will be subjected should be considered in making filtration tests if well conditions are to be duplicated. By using a high-pressure tester and heating the sample to the degree of temperature the circulating fluid will reach, the water loss at several pressure points can be plotted and an extension made to determine the behavior of the fluid with reasonable certainty under operating conditions.

It has sometimes been stated that a mud cake will form only on formations definitely considered porous because the building up of the cake is caused by water from the mud passing out of the fluid and into the pore spaces, thus leaving the solid content to form a sheath on the wall of the hole. It has also been assumed that loss of water from drilling mud increases with increased permeability of the formation being penetrated. Yet mud is known to plaster the walls when the formations are extremely dense; and thin mud cakes with low water loss have been formed on highly permeable sands when the mud has been compounded to have high wall building properties. Extensive tests** have been made with various muds to determine the plastering effect on cores whose permeabilities ranged from 10 to 14,600 millidarcys; and from the results of these experiments it can be concluded that, within these limits in unfractured consolidated cores, the plastering behavior depends only upon the properties of the mud fluid and hence is independent of the formation permeability.** It must be remembered that porosity is only the volume of pore space expressed as a percentage of the total volume of the rock mass. Permeability, however, is the measure of the size of pore openings in a formation. A porous medium has a permeability of 1 darcy (1000 millidarcys) if a rate of viscous flow of 1 cubic centimeter per square centimeter second of a fluid of 1 centipoise viscosity is caused by the application of a pressure gradient of 1 atmosphere per centimeter.

Effect of Low Water Loss

The results of compounding a mud with low water loss are both protective and preventative. The desirability of preventing water infiltration into a productive zone while drilling through the oil sand is well recognized and a mud with the lowest water loss possible is the best mud that can be used. Not only is initial production decreased by water tions definitely considered borous lost from the mud into the sand but the ultimate yield will frequently be lessened. Oil base muds are employed by some operators for drilling through the oil bearing formations but the present technique developed for conditioning clay-base mud for the purpose provides the advantage of utilizing the mud already in the hole. The extremely low water loss of muds treated with an organic colloid† will be discussed in a later article as will also the use of oil base muds for drilling through producing zones.

It must be remembered that productive zones must be protected from water infiltration whether they are upper zones exposed while deeper drilling is in progress or whether they are encountered immediately before completion of a well. The smaller the possible well potential, the more urgent is the requirement of preventing infiltration. Low-pressure oil bearing formations have less resistance to infiltration of water than have high-pressure sands and there have been cases where profitable small production has been lost because of injury caused by the water blocking off the flow of oil into the well. The effect of water infiltration is indicated in Figures 1 and 2 which show the difference when a mud of low water loss and a mud of high water loss is used. A well should not, of course, be washed with water for the purpose of removing the mud cake. If the mud is properly compounded, the cake deposited on the face of the producing sand will be thin, soft and easily removed.

The water loss should also be given careful consideration when coring, taking samples from the wall of the hole and during such operations as drill stem testing. Many cores are taken in formations believed to contain oil or gas and the analysis of such cores is made to determine the kind and amount of fluid present in the pore spaces. It is therefore desirable to use every means possible to secure cores that will provide true information on fluid content of the formation.

The ideal core would be a sample of the formation as it lies in the structure before penetration by the bit and under pressure conditions identical to those to which it is subjected below ground. However, the oil, gas or water in the pores are usually greatly modified by two important processes before the core is recovered. First, inundation by drilling fluid flushing vertically downward from the bit and unimpeded by a mud cake, washes the formation fluids out of the stratum being cored to an extent dependent on permeability, rate of penetration, thickness of formation below nearest shale break, and magnitude of the excess hydrostatic mud pressure over the formation pressure. Second, the core barrel recovers the core and brings it to the surface from a region of high pressure to atmospheric pressure; and any gas in solution in the remaining oil expands and expels some of both oil

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"Ben, when you started this well, you used a Totco Recorder and Controlled Vertical Drilling Methods because you know that anyone can drill wells straighter and quicker and cheaper that way. Your own records prove it. But you got into trouble because you stopped using the Totco.

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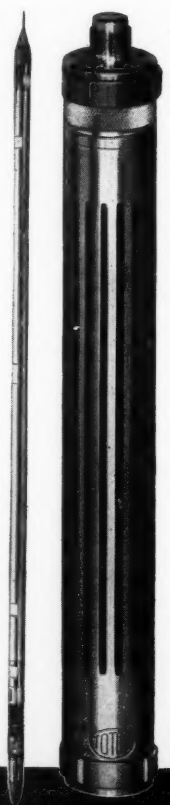
"I know you won't make that mistake again. Next well, stick with the Totco and Controlled Vertical Drilling Methods, and you won't have trouble. So long, Ben—it's my tour."

HERE ARE BEN'S FIGURES . . .



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and water from the already flushed core. In consequence, the amounts of oil and water found by analysis of the core differ from those in the original core.

Numerous attempts have been made to obtain unflushed cores. Several kinds of pressure core barrels have been used successfully for elimination of pressure influence but flushing of the core formation occurs before the sample is sealed in the barrel. Various clay base, low-water-loss muds and oil-base muds have been used; but flushing by either water or oil has occurred, depending on the type of mud used. Recent experiments indicate that the use of the extremely low water loss obtained by treatment with organic colloids may aid in obtaining cores in their natural state by preventing flushing of the cores before sealing in a pressure type barrel.

The low water loss of a mud will not, of course, have any effect on fractured or cavernous formations or on strata such as gravel or conglomerate where the openings are large enough to take the whole mud. Such formations generally cause lost circulation and must be given treatment by materials other than those constituting a good drilling mud. Low water loss muds, however, have been successful in making it possible to drill through caving formations or those that ordinarily become dispersed in the mud stream when muds with low wall-building properties are used.

In considering the water loss of a drilling mud, the degree to which the loss should be reduced will naturally depend on the purpose for which the mud is to be employed. This will naturally determine not only the kind of treatment to use but also the extent to which the mud should be treated. The water loss should be kept low enough to provide sealing with a cake thin enough to eliminate any chance of damage even under the most favorable drilling conditions. And after the desired water loss is determined, it must be maintained if it is to be effective. Chemical treatment may alone be required; or more colloidal material may have to be introduced into the mud stream.

A factor in mud conditioning to be considered, not only for its effect on mud performance but also as an indication of weakness of other characteristics, is the viscosity. The subject of viscosity will be discussed in a future issue.

Footnotes:

*"Mud Control for Efficient Drilling Operations," California Oil World, Second Issue, December, 1945.

**"The Effect of Formation Permeability on the Plastering Behavior of Mud Fluids," by H. T. Byck, presented at Mid-Year Meeting, American Petroleum Institute, Fort Worth, Texas, May 29, 1940.

†A prepared organic colloid for treatment of drilling mud to provide a water loss down to 1 c.c. or less is sold under the trade name of Impermex.

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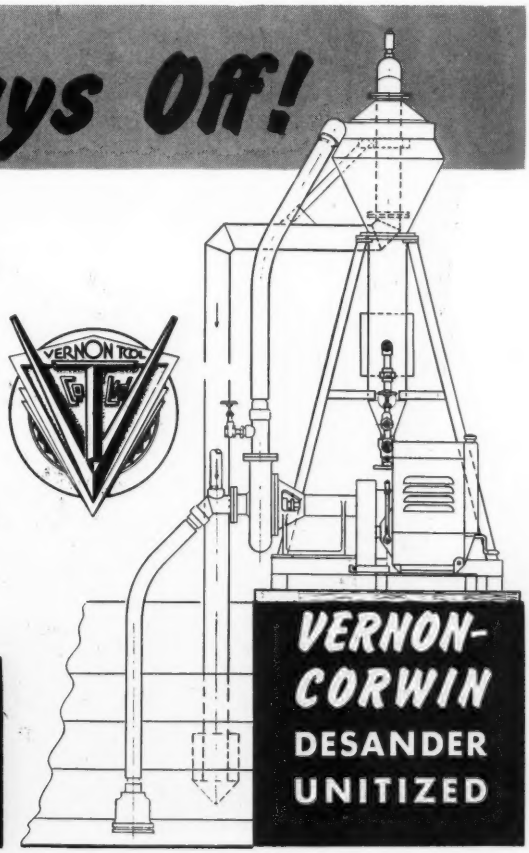

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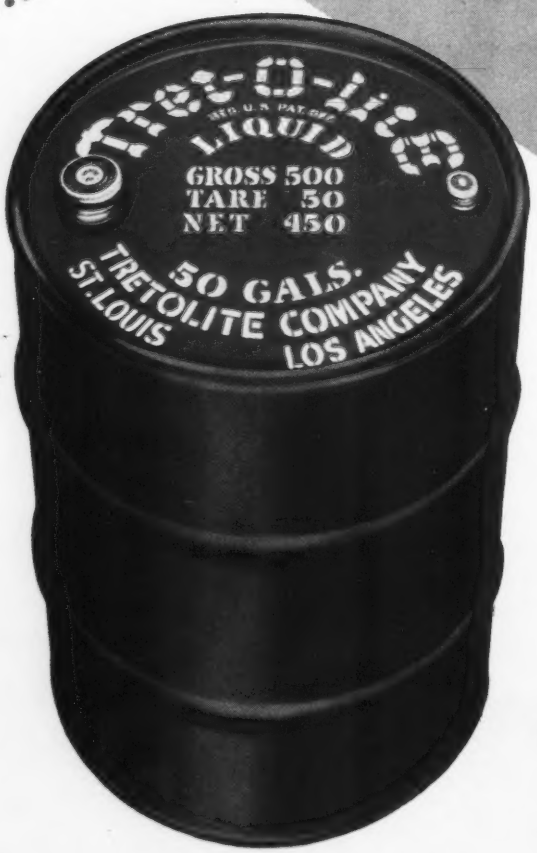

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46-A

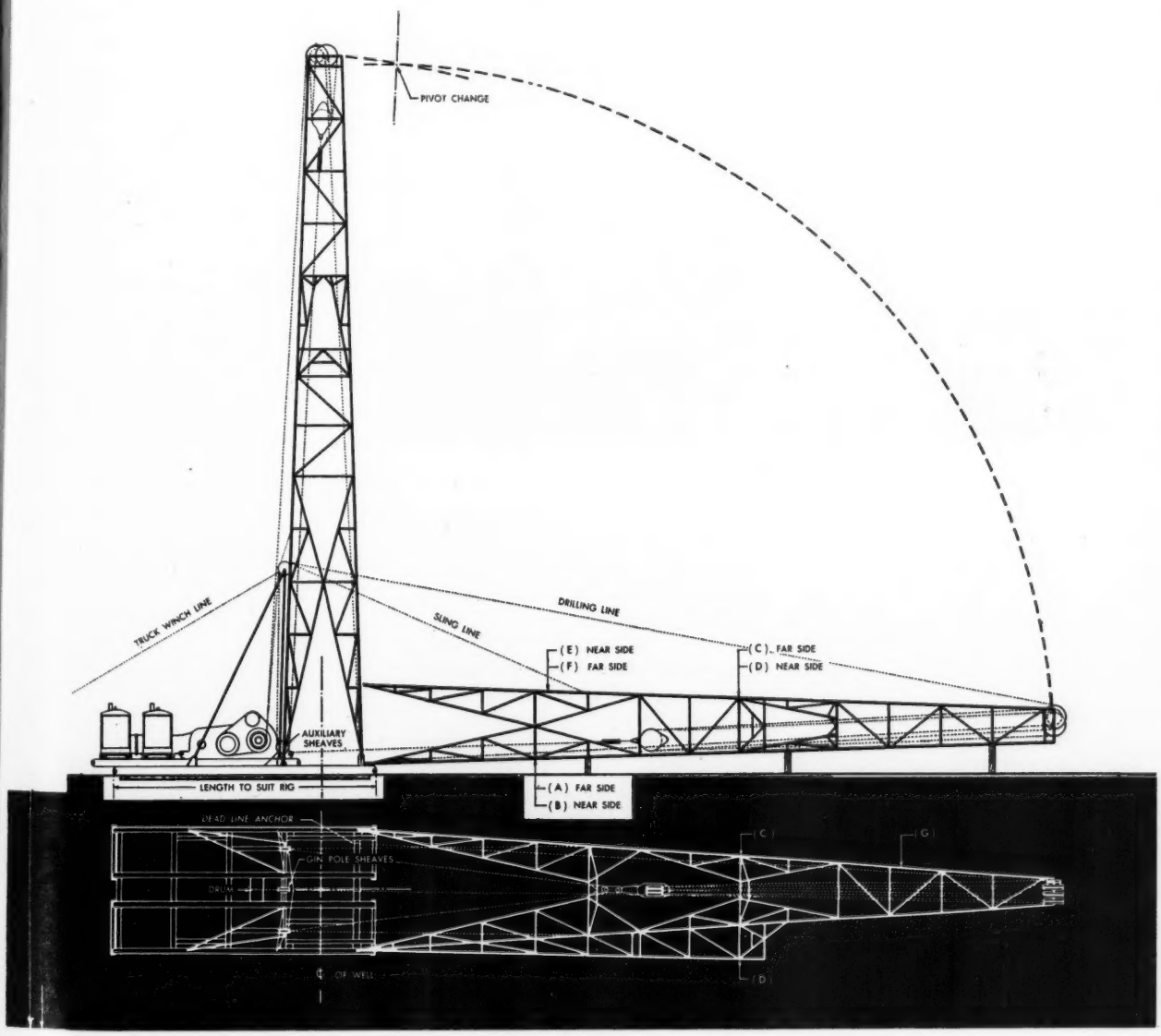
New Portable Mast Features Bulge Construction

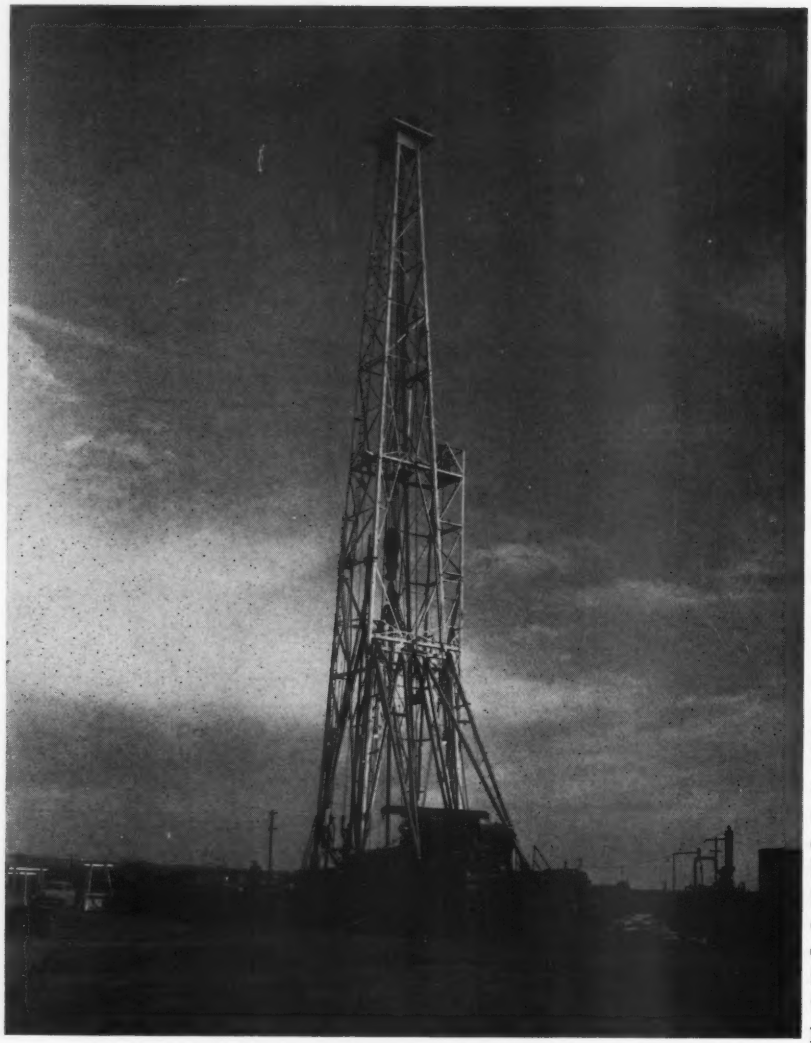
Portability of equipment is a matter of economic consideration in many field development programs and in exploratory drilling to certain depths, as well as in the servicing of wells. Portable equipment for these purposes ranges from masts integrally mounted with drawworks and prime mover, to unitized rigs operating in fixed derricks of the standard type. Between these extremes are portable derricks or masts that are transported separately from the unitized rigs and that give a high degree of portability to the entire drilling of servicing assembly. In this category is a new design of portable mast* that incorporates several innovations of particular interest.

This mast, as can be seen in the accompanying illustrations, is a bulge type and was designed to secure proper balance between portability on the one hand and the safety and convenience of the drilling crew on the other. It is shop-fabricated in sections to make it convenient for hauling; it is assembled on the ground or on cribbing in a horizontal position. The crown and travelling blocks are completely strung for drilling while in this position and the mast is then raised by means of the drawworks. When local conditions permit, the mast may be hauled from one location to another in one piece after being assembled. Any standard unitized drawworks and any rotary table may be used.

The mast is manufactured in two sizes; one with a height of 94 feet and the other with a height of 129

* Emsco Bulge Type Portable Mast





The new bulge-type mast in operation.

feet. The base dimensions of the smaller are 10'x16' and of the larger 12'x18'. The top of each is 3'-6" by 4'-6". The crown block is concentrically mounted with one 36" and two 30" roller bearing sheaves and a 21" dead line sheave. A sand line sheave and a third 30" sheave are optional. The smaller mast breaks down into seven sub-assemblies and the larger one into nine. The crown block assembly bolts to the top section and may be removed when necessary but is usually hauled bolted in place and is considered part of the top assembly. The gin pole is hauled in two sections. The mast is erected on a skid base which breaks into two main sections connected by short spacer beams which bolt into place. The sub-assemblies are bolted together with splice plates. It is not necessary to unstring and restring the crown and travelling blocks when moving from one location to another since the travelling block can be pulled up into the top section and the reserve line from the drawworks coiled on a spool and loaded with this section.

An interesting feature of the mast is the bulge or offset which provides for racking pipe inside the base of the derrick and eliminates the use of the open face on the window side. Lacing of all four sides of the mast is thus possible. Because the space outside the mast is utilized for racking the pipe, the bulge provides clearance for the working platform of the derrick man as well as for fast moving of the travelling block. The masts are designed to accommodate entirely within the bulge the following quantity of pipe:

Size of Drill Pipe	Number of Stands	
	Small Size Mast	Large Size Mast
2⅞"	195 doubles	195 trebles
3½"	143 doubles	143 trebles
4½"	108 doubles	108 trebles
5 9/16"	70 doubles	70 trebles
6⅝"	48 doubles	48 trebles

The rated load capacity of the smaller mast is 437,000 pounds and of the larger 537,000 pounds.

Another feature is the method used for securing line control during erection. After the mast has been assembled in horizontal position and the gin pole erected, the front legs are pinned to front shoe plates on the base. These front shoe plates are made with vertical extensions containing slots in which the front leg pins ride. The derrick is slowly raised by spooling the line on the drum. The pivot points during the raising of the mast are the front leg pins which form the center of rotation. The front legs are shorter than the back legs and just before the mast reaches the vertical the back legs seat on the back shoe plates. The pivot points then change from the front leg pins to the back leg pins and the front leg pins start climbing in the front base slots until the mast is vertical. An automatic safety latch drops into place under the front legs and remains in position until deliberately released. This design was made to prevent the center of gravity from passing over the supporting bearing, thus eliminating chances of a slack line.

No guying of the mast is employed. The erection gin pole is left in place for lowering of the derrick, and connector plates cause the gin pole to act as a buttress to the mast to give it added stiffness and stability. A crown safety platform, extending on three sides of the mast, provides safety while servicing the crown block. Sheave guards may be installed. A split board type

(Continued on Page 56)

Motor Voltage Considerations in Oil Refineries

By
E. KUN,
The Lummus Company

The selection of voltages for motors in oil refineries and similar industrial plants is commonly determined in accordance with rules and practices established for a number of years, and not on the basis of economy as affected by the latest developments in the arts and with consideration to supply system requirements.

Three-phase motors for 440 volt and 2200 volt service are the types most frequently used, with a dividing line varying between 50 and 100 HP with the different industrial plants. The reason for going to 2200 volts for 100, 75, 60 and even 50 HP motors is claimed to be a saving in cables and conduit for the motor circuit, and a saving of transformer capacity when the usual 2300 volt distribution system is available. In former times when 2200 volt motor control equipment of standard type (NEMA—I enclosures), and low interrupting capacity could be used, a saving could be obtained by applying the higher voltage to motors of sizes under consideration. Today, however, due to the more or less universal requirements of the so-called "explosion-proof" (Underwriters' Class I, Group D type) control equipment, and the higher interrupting capacities demanded by the electrical system, the use of the higher voltage, for sizes of motors up to and somewhat above 100 HP, usually results in a waste of money and space for control equipment.

The purpose of this article is to determine the practical limitation of motor sizes for the economical application of voltages. The following tables contain approximate costs of material which are representative figures for motors, control equipment and wiring in oil refineries, where "Class I, Group D" type equipment must be used. These figures should suffice for comparison, as labor costs are about proportional to costs of material.

TABLE I
440 VOLT EQUIPMENT

Horsepower	60	75	100	125	150	200
Motor, 440 volt, 3-phase, 60 cycle, 1800 RPM, squirrel-cage, explosion-proof	$ 851	$ 986	$1294	$1660	$1923	$2456
Controller, 440 volt, combination type, oil immersed magnetic, across-line, with circuit breaker, Class I, Group D, construction, including explosion-proof push button station mounted at motor	410	410	410	850	850	850
440 volt enclosed bus and interconnections at controller assembly	53	57	64	108	112	135
Motor feeder (varnished cambric insulated, lead covered cables) also push button pilot cable, including conduits and fittings for both, based on 100 ft. length	184	225	273	387	438	550
Estimated share of main 440 volt circuit breaker, and incoming service feeder	150	190	250	315	375	500
Estimated share of 2400/480 volt transformer station	240	300	400	500	600	800
Total of all items	$1888	$2168	$2691	$3820	$4298	$5291

TABLE II
2200 VOLT EQUIPMENT

Horsepower	60	75	100	125	150	200
Motor, 2200 volt, 3-phase, 60 cycle, 1800 RPM, squirrel-cage, explosion-proof	$ 972	$1107	$1385	$1746	$2005	$2514
Controller, 2200 volt, oil immersed, magnetic, across-line, with 50,000 KVA interrupting rating Class I, Group D construction, including explosion-proof push button station mounted at motor	1340	1340	1340	1340	1340	1340
Disconnecting switch, 3-pole, oil immersed, 5 KV or 7.5 KV rated	205	205	205	205	205	205
2200 volt bus and interconnections at controller assembly	160	160	160	160	160	165
Motor feeder, (varnished cambric insulated, lead covered cables) also push button pilot cable, including conduits and fittings for both, based on 100 ft. length	195	195	195	195	195	235
Estimated share of main 2200 volt incoming line panel and incoming service feeder	250	250	300	300	300	350
Total of all items	$3122	$3257	$3585	$3946	$4205	$4809

Comparison of Tables I and II indicates that motors of sizes up to and including 125 HP should definitely be for 440 volt service. In case of 150 HP motors the figures indicate a slight saving in favor of the 2200 volt motor. However, it must be remembered that the cost of motor feeders, incoming line equipment, etc., varies with local conditions, and the figures may vary slightly in favor of either voltage. The deciding factor should be, in this case, the higher maintenance of the high voltage control equipment, for which reason 440 volt equipment will prove more economical in the end, for 150 HP motors. 2200 volts should be selected for 200 HP and above, with equipment such as included in the above tables.

There are two other types of 2200 volt control equipment very often used in oil refineries. One is of switchboard panel construction, employing a low interrupting type oil immersed contactor with a set of high interrupting capacity type, current limiting fuses in disconnecting mounts. The cost of such equipment for semi-hazardous locations is approximately $1650 list (including controller, disconnecting device, bus and interconnections) and, therefore, the above conclusions should also apply when such equipment is considered.

Another 2200 volt control equipment is the so-called "Metal Clad" switchboard panel type, employing oil circuit breakers of 50,000 KVA interrupting capacity, disconnect-

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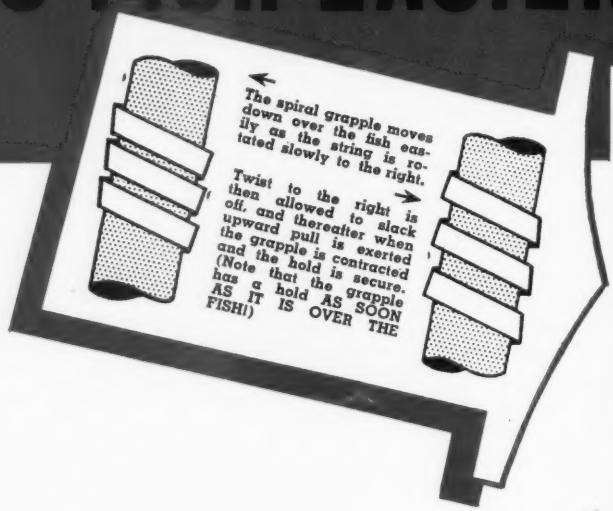
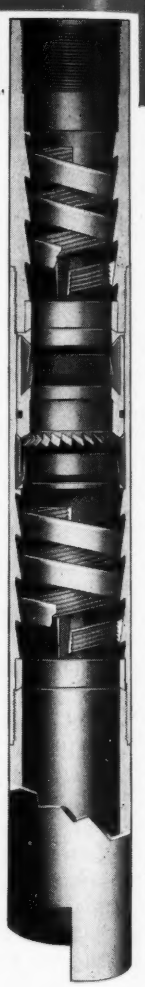

The spiral grapple moves down over the fish easily as the string is rotated slowly to the right.
Twist to the right is then allowed to slack off, and thereafter when upward pull is exerted the grapple is contracted and the hold is secure. (Note that the grapple has a hold AS SOON AS IT IS OVER THE FISH!)



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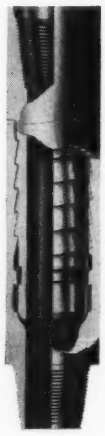

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able by means of a lowering device. The cost of such a panel is approximately $2500 net (including controller, disconnecting device, bus and interconnections) indicating that even 200 HP motors should be for 440 volt service for economy, where such 2200 volt equipment must be used.

An analysis, similar to the above, but based on standard industrial equipment, was presented in a recent issue of the General Electric Review, by D. L. Beeman of the Industrial Engineering Division, General Electric Company ("Industrial Power Systems," pages 17 to 20, incl., General Electric Review, April, 1945). Mr. Beeman's conclusions are that "for motors less than about 200 HP rating, reference to curves . . . will show that 440 volt motors make possible the least investment in the electric equipment, regardless of primary voltage. Thus, all motors rated about 200 HP or less should be operated on systems rated 600 volts or less, regardless of the primary voltage selected." He also states that "the effect of explosion-proof requirements will have little bearing on the basic factors . . ." which statement coincides with the analysis presented in this article.

Mr. Beeman further states that "Where a choice of primary voltage can be made, it is usually more economical to select 4160 volts than 2400 volts—even where the percentage of motors above 200 HP is as high as 50 to 60 per cent of the total plant load."

As a rule, oil refineries use 2300 or 2400 volt systems with 2200 or 2300 volt motors for the larger sizes. Motors for 4160 volts are somewhat more expensive than for 2200 volts. The present approximate costs of 4160 volt, 3-phase, 60 cycle, 1800 RPM, squirrel-cage, explosion-proof motors are:

75 HP	$1550
100 HP	$1950
125 HP	$2360
150 HP	$2560
200 HP	$2960

The cost of control equipment and other items, for 4160 volt service, is about the same as those given in Table II. Therefore, in a new development where the choice between 2300 volt and 4160 volt distribution is not impeded by consideration for existing installation, the choice can be based on the saving in the distribution system effected by the use of the higher voltage, as against the higher cost of the 4160 volt motors.

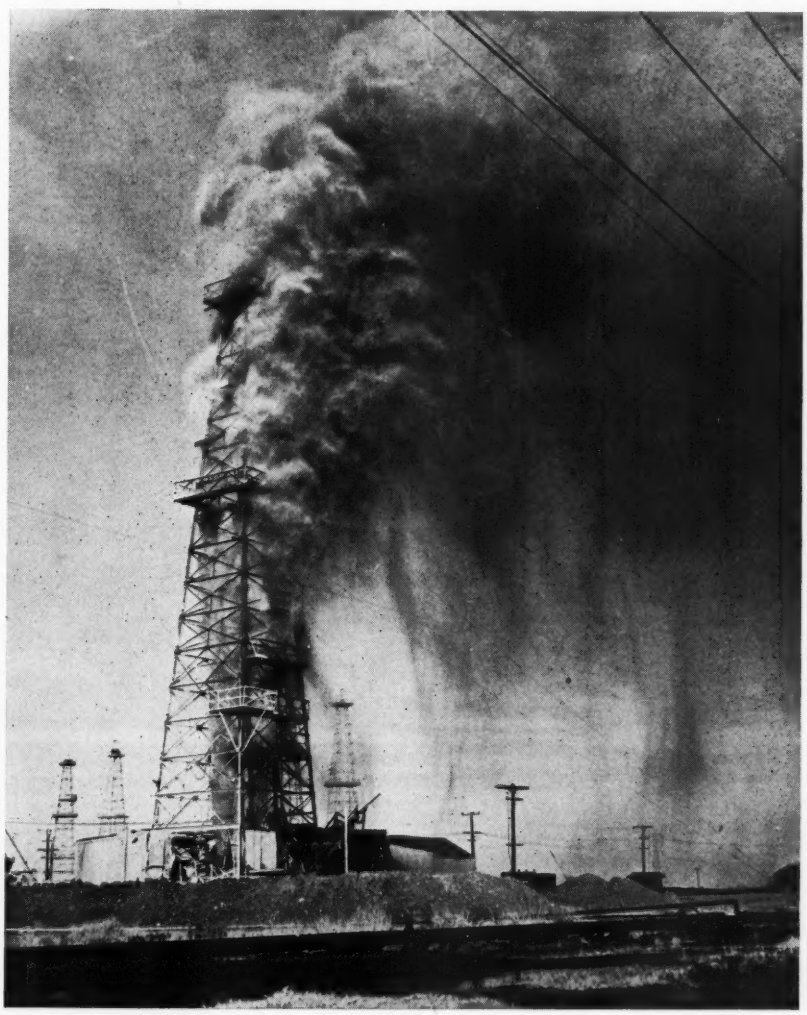
C.N.G.A. Admits New Members

Carlton Beal, petroleum engineer; G. P. Brockman, Richfield Oil Co.; Paul Gooder, Union Oil Co.; and H. Heilman, Southern Calif. Gas Co., were recently elected members of the California Natural Gasoline Association.

New Association Statistical Body

Personnel of the recently organized statistical committee of the Western Oil and Gas Association includes H. A. Lapham, Union Oil Co. of Calif., A. C. Saul, Shell Oil Co., Inc., Earl Wagy, Standard Oil Co. of Calif., Don O'Neill, Independent Refiners' Association; Stark Fox, Oil Producers Agency of Calif.; and Marion Fort, Pacific Lighting Corp.

BUY U. S. SAVINGS BONDS



—Photo by Stiefler.

The above photo shows the Hellman Estates No. 3 well at Seal Beach. This well blew out on December 23rd after having been redrilled to 5185 ft., and as the crew was fishing for drill pipe.

Kern County OIL NEWS

On New Year's Day

At year's beginning in Kern, the "Good" situation was unchanged. Oil inventories of the state had gauged a loss that tallied far below supply. In addition to Elk Hills, cutbacks by year's end had averaged 56 M b/d. Even if restored this could not quench the thirst of tankers for early 1946.

Curtailment in the state was brunted by San Joaquin to total 65%. In this amount Kern County shared immensely. Then Uncle Sam sent New Year's greetings to neighbors near Elk Hills, and Navy seized three private parcels for oil reserves. Still Kern refused to bat an eye. Few headaches in oil had fouled the atmosphere.

With Kernfolk down at Pasadena the situation was not so good. The climate at the Bowl was too unusual for production. Cutbacks handed USC were not from any gentleman's agreement. But Kern and 1946 went right on marching on.

Greetings

Richfield, B & M and Union will share the condemnation suits as filed for Navy by the government, annexing private holdings to the oil reserves. According to Charles Shomate at the Hall of Records in Bakersfield, the acquisition is for conservation protection of Elk Hills.

But greetings came from other sources and spent itself on other things. In scolding '45 for its unkindness to pioneers, new '46 hurried in with bad behavior. Two pioneers were summoned suddenly within the early fortnight of the year.

At Los Angeles in his favorite hotel, suddenly and without much ado the grim reaper appeared, and Arthur M. Keene wrote "30" to his colorful career. As editor and publisher of Taft's Daily Midway Driller, Art Keene had been identified with builders of the great "westside" for over 40 years. Quite often in the leaner years his publications and their optimism were mediums by which hope was deferred with little fear and grumbling.

Senator James I. Wagy had lived to see the end of four major conflicts, called war. In the span of his 81 years he had fought many a war of political science himself. He always won, and went about his business in a gentle effective way, and "did no man" any harm. After holding the highest offices of the county

KERN'S BIGGEST LITTLE CITY: Taft is the gateway to one of world's greatest empires of Black Gold, which begins at Rose Station, Wheeler Ridge and continues 50 miles wide along Airline Highway for 150 miles. Here repose 18,000 souls whose principal occupation is "oil" and its allied enterprise where it is produced. For half a century now increasing returns have flowed from wells manned by workers who were told that the "BOOM" was temporary. Many and most of the workers are still there on a temporary basis of 50 years each. There is rumor that permanent residence may be applied for. Taft is good for 300 years . . . say some.

and area he retired at the end of his 16th year as state senator. A pioneer in the oil world of the state he served in high capacities that helped to make the industry great. His work is done. His influence for good was so well known that the **special session** last fortnight ago adjourned, to pay respect.

On the eve of the anniversary of fifty thrifty years of oil in Kern there are still more fields to conquer. Last year the news on pools of oil potentials looked real good. Three things stand out in Kerngenuity. Edison with basement, Cymric with its cynic dope, and Santiago Creek in narrow channels of good going. Kern tasks of venture paid good dividends, put faith in risk capital enterprise, ala American system.

And so with wildcat fields in motion . . . with hurrying oilwigs here, there and everywhere . . . with new found lands of oil and pools . . . the greetings although mixed at early season . . . spell what it takes to make a cycle of prosperity.

Transferred

To Tret-O-lite's Kern office came James Chescheir, crude oil dehydration engineer. Said Tret-O-lite's F. C. Gilbert, "he's our new field service personnel addition". From Los Angeles office out on Telegraph Road "Gib" came to Kern to do a job of selling and make good. That was several years ago. With him is his wife Jewell and their kids Judy and Pat.

Burt Bevins of Taft's Oil Well Supply, Neilsen Pump Division was sent to Texas. At Dallas his assignment is with "Neilsen" division exclusively. Since "Oil Well Supply" is U. S. Steel's subsidiary, Burt thinks they'll feel the strike in steel. Wife Jeanne and sonny Elliott will join him soon in Dallas.

At Garner's "garnishery" on old North Chester's supply lane, the oilwigs meet in daily chore to chat and chow and get "knowhow". Last week your roving reporter stopped in at Wayne's to chow and chat.

Jake Vandelei, the city dad who wields a wicked anvil arm as blacksmith of the oilfields, was crowned in homely style as "father courageous" in his council portfolio.

Hopper Machine Works' Pete Gignioux went congressman hunting after lunch to tell his story of red ink for upping the hire of hands before product sales adjustments by OPA could be determined.

Carl Eggers of the State Sales and Services stood talking with his friends from near the "row" and Taft. L. V. Weddle of Kern Valve and Deep Hole Chuck McKee of TVS at Taft.

Acknowledgements

First in 1946 to appreciate Kern Oil News were: Charles H. Biggar architect, H. B. (Henry) De Lacy

A SIGN OF QUALITY

THIS IS IT . . . "THE EDISON BASEMENT". Ten miles southeast of Bakersfield with Bear Mt. for a background stands the derrick or the stairway to the famous "Edison Basement" which was considered the "Exploration" of the year.

public accountant firm of Hoisington and De Lacy, J. H. Hanks Kern County Assessor; Will Haberfelde and George; Colonel Frank Hornkohl, with checks to COW for another year's subscription. Names make news and advertising makes white space available for it. California Oil World is the only publication that gives such recognition to the importance of the Golden Empire of Kern. Also E. L. Blanck, B & M Oil; Cal Williams, photographer, Charlie Elwood, Oliver Implements with tractors for the oilmen.

California Tax Payers Association's "Tax Digest" has set the population of Kern County at 184,000 souls. Based upon reliable indices which are sources for accurate estimates of population in relation to ADA of schools the figures are conservative. Many believe that 200 thousand will soon be counted when housing problems cease.

Traveling to Kern from Los Angeles was Robert C. Patterson vice president of Kern's big Belridge oil. With him he fetched good natured L. B. Banderob, field manager of the Kern concern. **Their mission: "strictly educational"** said Pat with a grin from ear to ear. Before going to Belridge Pat was head of USGS both at Taft field office and Los Angeles facility. He knows every phase of the oil industry from the bottom of the hole up.

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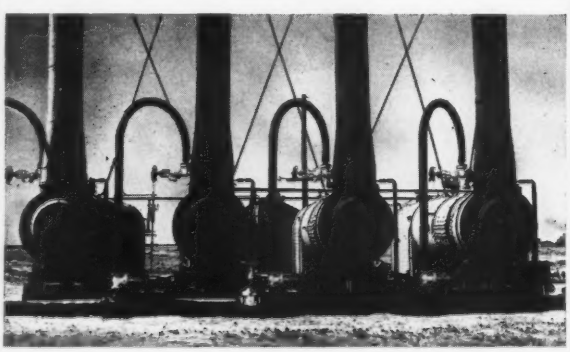

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Facts and Figures

San Joaquin Valley has a million people. A third more than San Francisco. The assessed valuation of the 11 San Joaquin counties is over a billion dollars. Commercial organization executives should apply themselves and acknowledge their great opportunities here. Industry, transportation and tourist travel.

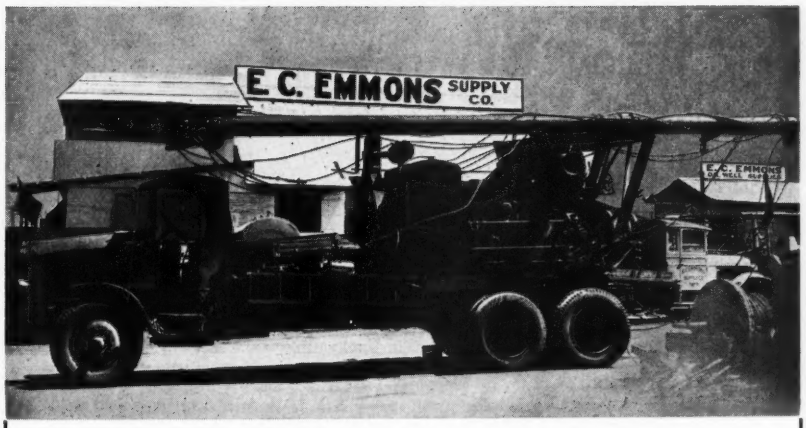
Speaking of Tourists travel which pays many a million in taxes, a meeting to encourage it where Bill Hammond of U. S. Chamber attended, was useless when a few hours later he saw tourists stopped at state lines unpacking for armed guards.

Highest per capita assessment figures go to Alpine county which total $5820.00, with low score for San Diego which tallies only $682.00. Kern has $1905.00. . . . Los Angeles $831.00 and San Francisco $1058.00. Kern is sixth but fifth in total valuation dollars, after being nosed out by Fresno with a few hundred thousand dollars . . . or less than a million more. Kern's $351 millions show the highest it has ever been. Fresno is larger than Sacramento, by the way, in case one belongs to the "didn't know it" column.

Union Oil's Marketing Division is ably represented by E. J. Van Patton of Fresno. Recently looking for factors that spud in service stations, Van was wearing a brand new "76" smile that predicted cleaner windshields for 1946 . . . and of course a lot more often.

One day this month a picture directive came from COW to editor of the KON, and local **shutters** went scurrying to see Ted Sawyer over at headman's office for Schlumberger Well Surveying Corporation. Newshawks thought Ted had discovered how to drill for oil with atomic energy, but he simply announced the return of an old service which was out for the duration.

Ted is a sociable sort of a fine gentleman. He came up here in 1937 and made a record for his firm and himself. He lives on "oilfee" heights at La Cresta. His right name is Theodore of course and he answers to Ted. Mrs. Sawyer's name is Kathryn who is a good booster for Ted.



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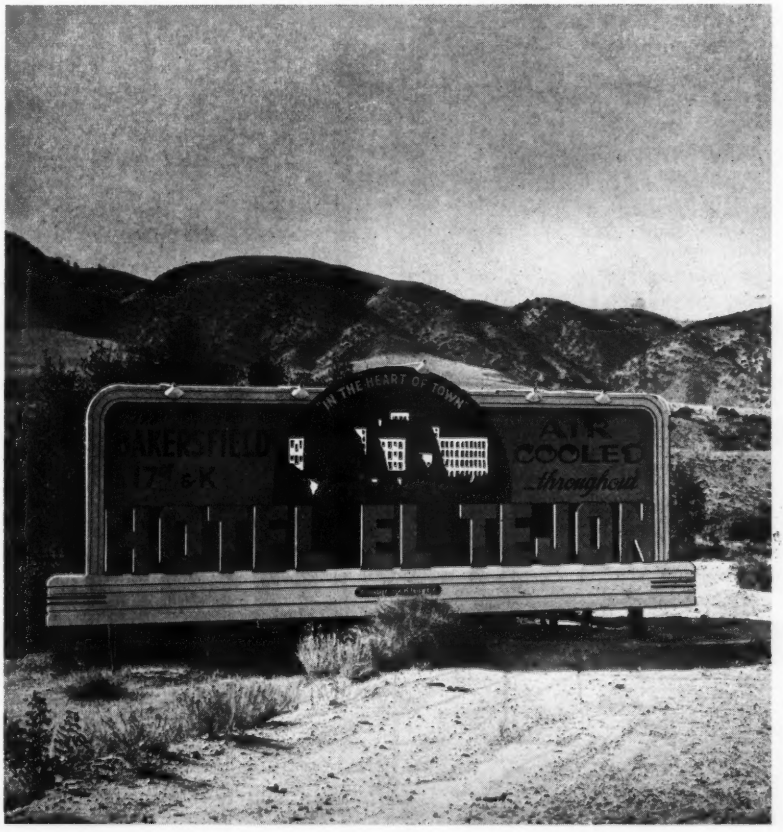
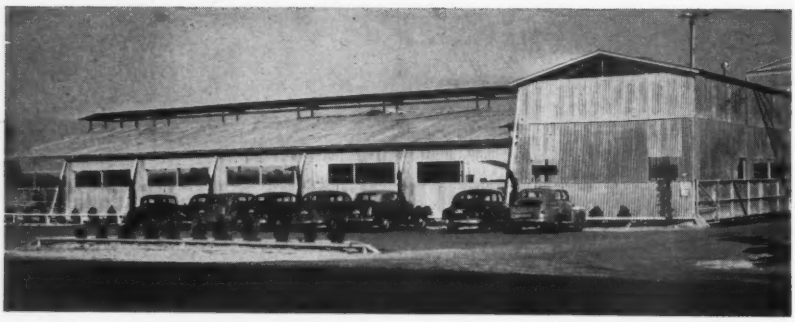




IT WAS A ROCKY MOUNTAIN YEAR IN 1945: Rocky Mountain Drilling Company's new home on Contractors' Row proved up a new shopping district for heavy industry in 1945. This building made up of used tubular pipe furnished by Western Oilfields Supply Company, has revolutionized the warehouse blue-prints at pre V-E Day.

Ted is a very fine graduate petroleum engineer from Stanford.

What has become of Harry Godde of Signal Oil?

W. W. Murphy of M & O scouting service was up over the past fortnight's week end. He was seen talking to lobbyists of the El Tejon Hotel. . . . Warren Ten Eyck . . . remember him?

Kern Oil News for 1946 looks good . . . there is much to be told and not reported both . . . not only in technical news but personals as well. News items coming in are generous and easier to obtain. Suggestions on this opportunity of personal **reporting are taking form.** More are needed.

ANNUAL DINNER San Joaquin Valley Oil Producers Association. Jan. 30, 1946.

Taft according to E. C. Emmons of the supply company by the same name, has every reason to keep cheerful for 1946. Situated almost between and in the middle of two of the three discovery pools in Kern in 1945, the prediction holds some logic. If Tasco's steel foundry will cast repairs and make soil pipe for houses it will help the oil industry.

Sixteen years ago Charles Manley of Oil Field Construction took some of his customers to the Rose Bowl Football classic. Every year since that time he has made this an annual custom. This year at Pasadena his New Year's party consisted of the Warren Johnsons, Art Wilsons, Frank Tolfs, and the Frank Sanders of Standard Oil. Then there were the Frank Coltons of Tide Water Associated and the Fred Nighberts and of course the Charles Manleys.

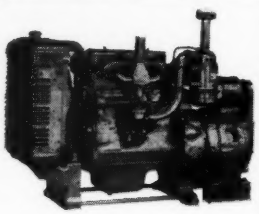
Lunching on fried chicken the party was reported to have been in a holiday mood until after the massacre of USC by 'Bama. No wonder we couldn't any duckets in Kern County.

Edison Basement Named Pool of the Year

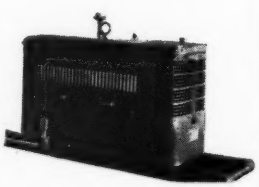
. . . runner up Cymric proves exciting with added "no dope" Indian signs. . . . Santiago Creek looks good with trying in a narrow field that strains exploration budgets.

The Electric Power Unit with the BUILT-IN WATCH DOG

INTERNATIONAL-PALMER
ELECTRIC POWER UNITS



have a built-in safety feature—the Palmer Self-Regulating Alternator, which holds its voltage from no load to full load within 2% plus or minus at unity power factor, has high starting torque and high efficiency (will carry 25% overload 4 hours without overheating), and requires neither voltage regulators or switchboards. Electric motors can be started up to full rating of alternators. For International-Palmers, with skid bases and hoods, call —



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By every sign and portent the Edison oil field bones were long picked dry. "Granite", they said, was never thirsty for oil . . . rather it is oil's stop sign . . . the "23" insignia for drilling squads. But one day last year when summer was eight days old, a tired sweat drenched crew on June 29, punctured the schist to the basement.

Independent Exploration Company's geologists reported it and scoutwigs said that the event led to oil discoveries in an unexplored "stratigraphic province" of San Joaquin Valley, according to Paul Julian Howard petroleum engineer authority of no small repute.

Harry H. Magee Oil Company, exploration drillers completed the work on June 29 for Brockman 3 at between 2218-2301 feet in the basement strata. Since then a score of rigs have probed and been successful in and around section 13-30-29 which is the extreme northeasterly edge of Edison Field.

To the Magee Company go congratulations for courage and hope . . . especially to Jack Qualman an oil orchid is surely due. Thanks also to Laurel Saunders who was ever hopeful.

As described by geologists the "basement" layer is a schist formation which occurs in tiers and windows on top overlying the acid granite rocks of the Sierra-Nevada belt, but considerably older. The schists are dated to the Jurassic period in the Mesozoic area in the geological time table.

Even though the previous production came from above the Edison Basement, since the field's discovery in 1934, the chemistry of the oil from the upper and lower sections are basically the same. "The oil migrated up strata", said Howard, "and when it came in contact with the fractured schist zone, it filled in around the open spaces," Howard concluded.

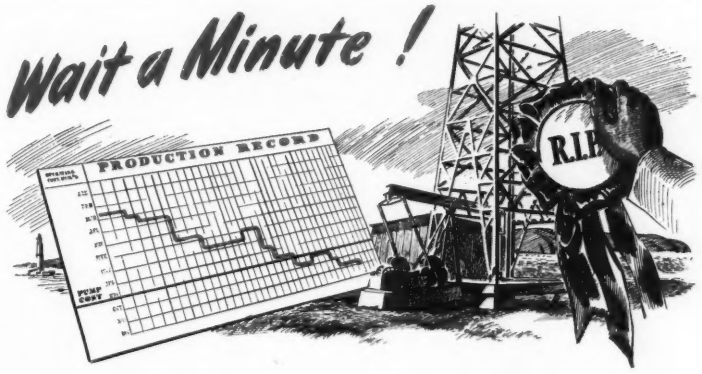
The story is pretty well known now by the industry all over the country. Brockman 3 did about 528 barrels a day and produced 19.2 gravity oil. Other wells have been drilling ahead successfully with good production in depths from 2281 to 1326. Daughtery 3 well was the second to puncture the basement and it also is operated by the Independent Exploration Company which tapped a gas cap in the top of the schist at about 1800 feet.

Acceptable are the theories advanced by various geologists who agree with Paul Howard, that the oil migrated on top of marine sediments or sedimentary sand forming the basement floor on top of the granite. The oil went into the severely faulted and fractured rocks. Therefore, the production comes from fractured metamorphic rock of the probable Jurassic age.

Farmers here with land thirsty for water were interested because both the upper and lower underground Kern Rivers were traversed above the basement.

Midwinter Conservation Meet

San Joaquin Oil Producers this month heard James Mussatti, general manager of California State Chamber of Commerce, emphasize

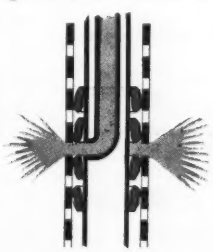


High-Pressure Washing may bring that "dead" well *back to life!*

Before you abandon that well which no longer pays its pumping cost, read and consider this statement of fact:

Time after time, operators in almost every California oil field have called in McGaffey-Taylor to wash supposedly dying wells: in a high percentage of cases, the use of M-T Pressure Washer has turned those "dying" wells into profitable producers—some of them producing even more than when they were first brought in.

To get the full story on *how* and *why* the McGaffey-Taylor Pressure Washer is able to remove the hard-packed material which gradually strangles a well,



Write for NEW Well Washing Bulletin, or ask a representative to demonstrate transparent model.

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TROUBLE: CORROSION

This photograph shows casing and joint ruined by corrosion. The GAP at every joint of regular casing is an open door inviting such corrosion . . . and there are 115 GAPS to every mile!

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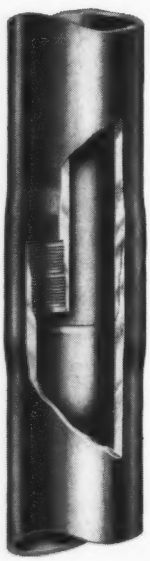

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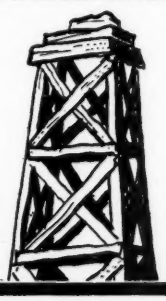

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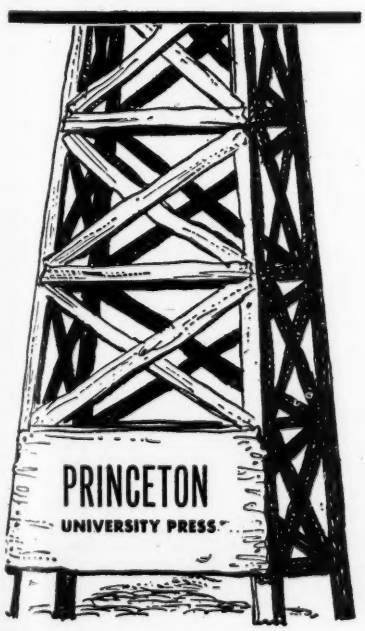
THE

Wildcatters

By SAMUEL W. TAIT, JR.

Illustrated with photographs



the need for increased industrial production as a remedy for inflation.

Mussatti spoke before 125 oil producers present at the midwinter conference of the Conservation Committee of California Oil Producers, held at Bakersfield Inn. A large attendance was present from Los Angeles. Members of the API chapter here delayed their regular meeting to attend. Preceding the address Conservation Committee Chairmen made their reports.

Joseph Jensen, chairman of the Committee, served as master of ceremonies and reported activity since last June. Controls are still imposed on a basis of practical engineering research.

William R. Wardner, Jr. Manager of the Producers praised the work of Barney Barnard, chief field deputy northern division with headquarters here. He also had praise for the Edison field committee consisting of independents who tapped the "basement strata" at Edison last year.

A. H. Bell Chairman of the Engineer Sub-Committee, cited the **maximum efficiency rate** program, (M.E.R.'s) while William Clark, speaking for Herb Starke, chairman of Buena Vista Hills district . . . outlined the activity of the Pool Committee and how it functions in the operation of individual wells.

Problems of taxation in the U. S. were presented by Mussatti, and the faults were compared with a choice between "socialism or capitalism". Mussatti believes the American system has made America what it is today.

Bureaucracy was hit by Mussatti when he declared that 317,000 civilian government employees worked in California, a figure 40,000 higher than state workers and more than in Washington, D. C. He compared the figures of the national debt now of $300 billion with the figure ten years ago.

Solution to the problem according to Mussatti might be: 1) stop national deficit by spending less money; 2) stop making fantastic promises to Americans and other people of other nations; 3) increase production; 4) adjust OPA rulings and stopping strike movements; 5) decentralize national controls; 6) cut out influences that cripple private

HORSING AROUND

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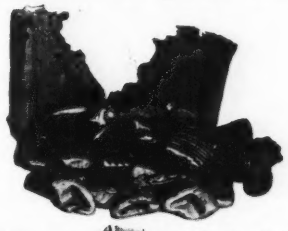

(Below) An assortment of Metal Junk

(Above) Rubber Sleeve, Slips, and Pieces of Body of Bridging Plug

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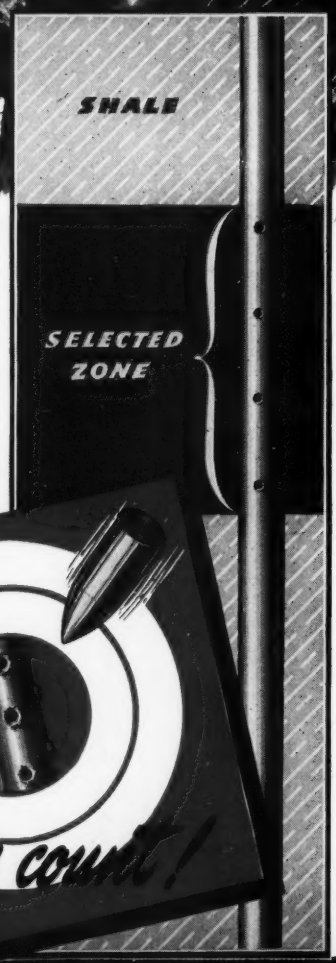

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VENTURA, CALIF.
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AVENAL, CALIF.
SACRAMENTO, CALIF.

industry and choose between capitalism and socialism. "The two won't mix," he said.

Mussatti was for revising and simplifying federal income taxes and removing duplication of revenues.

A buffet supper was served by the Committee after which the Shell Oil Company showed an extremely interesting motion picture on recreation.

Those attending were:

NAME	COMPANY
R. H. Anderson	Kern Land Company
Mervin T. Miller	Standard Oil Company
E. G. Bemis	Standard Oil Company
E. J. Coenen	General Pet. Corp.
J. J. Oliphant	General Pet. Corp.
J. C. Sitterle	Standard Oil Company
D. G. Kingman	General Pet. Corp.
J. W. Noble	General Pet. Corp.
Lot Bowen	Western Gulf Oil Co.
J. B. Wharton	Western Gulf Oil Co.
C. E. Smith	Union Oil Company
Ralph W. Rampton	Union Oil Company
K. C. Vaughan	Union Oil Company
T. H. Wallace	Western Gulf Oil Co.
B. H. Murphy	U. S. G. S.
F. J. Schambeck	U. S. G. S.
A. B. Dooley	Belridge Oil Co.
H. W. Reynolds, Jr.	Belridge Oil Co.
Carl Tutschulte	Tide Water Associated
Thomas E. Weaver	Tide Water Associated
Ray E. Raley	Tide Water Associated
John H. Nichols	Tide Water Associated
J. D. Vasentine	Tuboscope
Erle A. Gray	Richfield Oil Corp.
Clyde Perry	Richfield Oil Corp.
B. G. Wilfert	Richfield Oil Corp.
H. P. Hassel	Richfield Oil Corp.
F. C. Hodges	Assessor's Office Kern County
J. H. Hanks	County Assessor
John L. Stephens	C. C. M. O. Company
C. F. Roeder	C. C. M. O. Company
Wm. L. Hobro	Shell Oil Company, Inc.
E. Armbruster	Shell Oil Company, Inc.
J. K. Smith	Himself
H. R. Hammett	Western Pipe & Steel
R. S. Bruce	Western Pipe & Steel
W. D. Woodward	Himself
R. L. Blunden	Honolulu Oil Corp.
K. Bright	Baroid Sales
Fred B. Williams	Baroid Sales
L. H. Peahl	So. Calif. Gas Co.
A. S. Olson	So. Calif. Gas Co.
J. A. Millen	So. Calif. Gas Co.
L. D. Banderob	Belridge Oil Co.
E. D. Press	Belridge Oil Co.
Ernest K. Parks	Independent—Los Angeles
R. Joe Stephens	Kern Oil Company
F. M. Ziegler	Kern Oil Company
C. R. Ball	Hillman—Kelley
R. N. Ayars	The Ohio Oil Company
R. M. Miller	The Ohio Oil Company
O. A. Cavins	Standard Oil Company
C. C. Scharpenberg	
Paul E. Lehr	Shell Oil Company, Inc.
Arthur MacKenzie	Union Oil Company
Dave Springmann	Union Oil Company
Basil Kantzer	Union Oil Company
K. J. Seib	Conservation Committee
G. G. MacDonald	National Oil Co.
Phil McCollum	National Oil Co.
Frank Goldman	Himself
Ross McCollum	National Oil Co.
J. T. Crooker	Standard Oil Company
W. G. Ireland	Standard Oil Company
Geo. L. Powell	Standard Oil Company
David R. Davis	Standard Oil Company
H. S. Dievendorff	Robt. S. Lytle, Oper.
Paul J. Howard	Consulting Engineer Tax Counsellor
D. J. Hall	McCullough Tool Company
M. W. Morris	Standard Oil Co.
W. L. Walker	
Fred W. Nightbert	Bakersfield Pump Co.
Chas. P. Prewett	Golden Bear Oil Co.
Claude Pearson	East Puente Oil Co.
L. L. VanEpps	National Oil Co.
Hoyt Gregg	National Oil Co.
Roland R. Fishell	H. H. & F. Oil Co.
John J. Mixon	Hope Oil Company
K. S. Ritchie	The Norwalk Company
H. Clyde Wood	Grove Regulator Co.
L. B. Lytle	Himself
George O. Suman	Tide Water Associated
J. Frank Guirado	U. S. Navy
O. W. Lynch	Western Gulf Oil Co.
J. H. Dearin	Carrec Oil Company
D. C. Roberts	Standard Oil Company
H. C. Stone	The Texas Company
Wm. I. Cunningham	Bishop Oil Co.
R. G. Russell	Bishop Oil Company
Keller Grigsby	Norwalk Ref. Company
H. A. Hopkins	E. & M. Oil Company
Robert C. Patterson	Belridge Oil Co.
H. F. Owen	Berry Oil Company
W. D. Gould	Tide Water Associated
C. R. Malone	Oil Well Supply Co.
I. N. Kuckenbaker	Shell Oil Co., Inc.
A. C. Wright	Shell Oil Co., Inc.
F. J. Toth	Shell Oil Co., Inc.
C. E. Sherertz	Standard Oil Company
Paul L. Fairchild	Calif. State C. of C. Fresno
John S. Hagestad	
H. A. Ingalls	
Emory Gay Hoffman	K. C. C. of C.
Roger Brown	Petroleum Equipment Co.
H. W. Abruns	North American Oil Cons.
T. W. Bell	The Texas Company
Geo. I. West	Westcrude C. Rubbert
Wm. A. Clark	The Texas Company
W. R. Wardner, Jr.	Conservation Committee, Manager
Joseph Jensen	Tide Water Associated
James Mussatti	California Chamber of Commerce
A. H. Bell	Chairman, Conservation Eng. Sub-Committee
M. C. Barnard, Jr.	Conservation Committee, Deputy
E. E. Pyle	

Allen Machine Announces Custom Built Perforator

A 12-Spindle pipe perforator, for milling slots in oil well and water well casing, was recently announced by the Allen Machinery and Tool Company.

The Perforator is designed to accommodate 3½-inch to 12½-inch O.D. pipe with slot range from .030 to .500 wide. It features an all electric feed and can be driven by industrial motors when electricity is not available. Spindles are heat treated alloy steel, mounted on roller bearings and driven by VEE belts.

The Allen Machine and Tool Co. have had almost 40 years experience in special machine manufacturing and have facilities for designing and building special equipment at the plant at 13409 South Alameda, Compton, California. Telephone NEvada 62707.

ELK HILLS FUTURE DISCUSSED: Development of California's Natural resources and the Elk Hills land condemnation plans occupied the recent "bull session" held at Bakersfield by California State Chamber of Commerce Natural Resources Department Director W. E. Stewart, and Chares P. Lake, prominent civic leader and oilwell supply operator.

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Field Development

PREPARED BY CALIFORNIA OIL WORLD NEWS SERVICE

Los Angeles Basin

Buena Park Try Running Liner

Production test is nearing for General Petroleum Corp., Librown No. 1 wildcat test in Sec. 21-3s-11w in the Buena Park area of Orange County. The hole has been cleaned out preparatory to running liner. Total depth is 12,600 ft., with casing set at 12,042 ft.

The drill started at this location almost a year ago. In the event commercial production is obtained considerable new drilling is the natural aftermath. Previous tries drilled in the general area have either ended up dry or with production of little consequence.

In the Brea area of the county, Fullerton Oil Co. has staked location for well No. 27 in Sec. 2-3s-10w.

Coyote Pass Try Moving In Outfit

Dumm Bros. Petroleum Corp. and Olympic Refining Co. are moving in equipment to No. 16 in Sec. 29-1s-12w in the Coyote Pass sector of Los Angeles, with expectations of starting the drill shortly. Drill site falls near the intersection of Ramona and Westminster Blvds. on a 600-acre lease. A wildcat, primary objective, is a surmised oil formation around 6000 ft.

Torrance Field Well Program

Milhay Oil Co. is planning to drill five wells in the Torrance field near the northeast corner of Normandie Ave. and Sepulveda Blvd. Company's program also calls for reworking two jobs.

Superior Oil Co.'s basement test in the old field, Torrance No. 66 in Sec. 24-4s-14w is making hole ahead at 3700 ft.

Montebello Test Ready to Drill

Atlas Production, Inc., headed by J. Paul Sievers, is ready to commence operations in Community No. 1-1, a wildcat test near the corner of Beverly and Norwalk Blvds. in Sec. 17-2s-11w in the Montebello area.

Del Valle Test Coring On Down

Superior Oil and British-American Oil Producing's joint Del Valle wildcat test, Black No. 1, about a mile from established production, is down 3260 ft. Digging in recent days in shale has been showing oil in fractures. Location is in Sec 13-4n-18w.

Bandini Holds Oil Spotlight

Still the focal point of Los Angeles Basin development interest, operations at Bandini in recent days were marked by Richfield Oil Corp.'s decision to carry its U. P. Unit No. 1 well in Sec. 9-2s-12w no further and to plug back from total depth of 9629 ft. to approximately 8550 ft. for a test of upper showings. A portion of these showings were tested some weeks ago.

Richfield's Simons No. 1 in sec. 15 has reached 7674 ft. and is reaming. Top of the Miocene is placed at 7522 ft. Vail No. 1 in Sec. 16 is drilling below 6600 ft. Keller No. 1 in Sec. 9 is grading ground.

Chanslor - Canfield - Midway Oil Co., represented in the area by Bandini No. 1 in Sec. 21, has drilled and cored the well to nearly 8300 feet.

Puente Explorer Drilling Ahead

A. W. Lyddon, independent operator, is drilling ahead steadily at 5600 feet in his No. 1 wildcat test in Sec. 17-2s-10w in the Turnbull Canyon area, near Puente. The property being tested is owned by the estate of the late William Rowland, who came to California in pioneer days and was identified prominently with development of the state's great citrus industry.

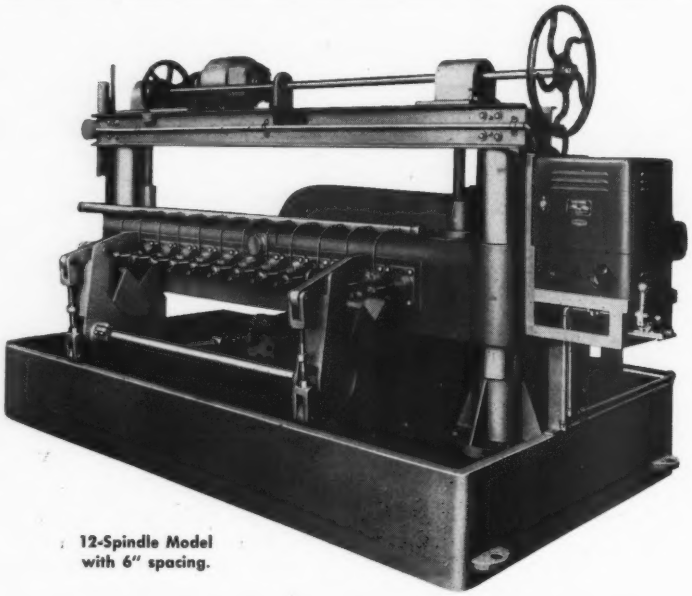
Costa Mesa Job To Be Deepened

Silver Divide Mines Co. is preparing to deepen the Sierra Trading Corp., Sierra No. 2 in Sec. 23-6s-10w in the Costa Mesa area. Present depth is 3233 ft.

Leffingwell Job Continues Tests

Standard Oil Co., Lewis Community No. 1 in Sec. 11-3s-11w in the Leffingwell area is ready to test sand around 6880 ft.

Elsewhere in the Basin, Standard's Baldwin No. 128 at Montebello is running casing after drilling to a bottom of 2330 ft. Kraemer No. 2-34 at Richfield is drilling at 4150 ft. Wigdal No. 1 at Aliso Canyon has reached 7650 ft.



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Yorba Linda Try Making Headway

In the Yorba Linda area of Orange County, Scoggins and Long are drilling No. 1 wildcat in Sec. 23-3n-9w at 2675 ft.

Del Valle Well Flows

Bankline Oil Co. has finished its Orduno No. 106 in the proved portion of the Del Valle field at a total depth of 3364 ft. for an initial yield of 176 barrels of 31 gravity oil and 160,000 cubic feet of gas. Flow was through a 15/64-in. bean. Casing was cemented at 3208 ft.

Shell Rigging In Alamitos Area

Shell Oil Co., Inc., has rig up for Communty No. 1 test in Sec. 3-5s-12w in the Alamitos area, Los Angeles County. Meanwhile, Dominguez Estate No. 1 in Sec. 2-4s-13w in the Dominguez area is drilling at 9770 ft. in sand and shale.

Coyote Job Cemented

Severns Drilling Co., No. C-7 in Sec. 13-3s-10w in the East Coyote area has casing, including some 500 ft. of perforated on bottom, landed at 5087 ft. and cement through perforations at about 4600 ft. Total depth is 5087 ft.

Placerita Test Still Inactive

The Petroleum Exploration Co., Kraft No. 1 test in Sec. 11-4n-15w in the Placerita Creek area, Los Angeles County, is partly rigged but continues to stand idle.

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San Joaquin Valley

Shallow Prospects Attracts New Test

Planning to further evaluate shallow prospects of the Dagany Gap area of Kern County, Shell Oil Co., Inc., has staked location for its University of California No. 2 in Sec. 3-25s-18e, approximately 475 feet directly east of the No. 1, which found some encouragement in going to a total depth of 1577 ft. The first try now is fishing for perforating gun.

The area under question is six miles south of Pyramid Hills.

Kern River Test Swabs

One of the most important projects current in Kern County is Tide Water Associated Oil Co.'s Luck No. 154 deep test in the center of the Kern River field in Sec. 30-28s-28e, which at last reports was swabbing after rigging Christmas tree. Drilled and cored to a total depth of 5998 ft., a depth hitherto untried in the area, 5½-in. casing is cemented at 5850 ft. and tubing hung at 5734 ft.

Company's holdings embrace about 90 per cent of the acreage in the area and discovery of new deep zone production naturally would be of particular benefit to Tide Water Associated.

Bacon Hills Try Retesting

Bandini Petroleum Corp. is drilling out its Bacon No. 1 wildcat in Sec. 27-28s-20e preparatory to retest, after the well was wet on shut off trial at 10,798 ft. Original bottom is 11,001 ft., with plug at 10,900 ft. Top McDonald shale was placed at 7060 ft.

Grapevine Test Coring Oil Sand

British-American Oil Producing Co. and Capital Co., Tejon Ranch No. 51-5 in Sec. 5-10n-19w in the Grapevine area is coring slightly below 2650 ft. in oil sand, with electric log run scheduled around 2660 ft. Top oil showings are placed at 2604 ft.

The No. 41-5, which widened the field about a half mile, currently pumps 90 barrels of 15.5 gravity oil a day, cutting 4 per cent.

Dominion Test Proves Duster

Drilled and cored to a total depth of 1532 ft., Maurer and Fisher's Jean No. 3 in Sec. 16-26s-28e in the Dominion area found the objective Vedder gray and barren, resulting in abandonment. Minor showings were picked up in the Jewett and in top Schist zone.

Ant Hill Try Suspended

As a sequel to swabbing water and oil, Shell Oil Co., Inc., has temporarily suspended operations in Parker Fee No. 88-16 in Sec. 16-29s-29e in the Ant Hill area. Plugged depth is 2425 ft.

Several miles west of the Mount Poso field, Independent Exploration Co. has made location for Lambert Lands No. 2 in Sec. 35-26s-27e. North of Mount Poso, Mitchell and Steele have given up S. P. No. 2 in Sec. 33-26s-28e at 2105 ft.

Gene Reid Quits Poso Prospect Job

Having found the Vedder gray and barren, Gene Reid Drilling Co. has abandoned Hooper No. 1 test in Sec. 36-26s-27e at a total depth of 2762 ft. Top of Olcese was placed at 1536 ft., and Vedder at 2726 ft.

Buena Vista Lake Well Getting Deep

Seaboard Oil Co., which recently abandoned its Evans No. 1A in the Aliso Canyon area, as an oil failure at 8209 ft., is drilling SWUM-BVA No. 73-14 in Sec. 14-32s-25e, a wildcat test in the Buena Vista Lake area, below 9800 ft. in hard shale.

Old River Well Ends Oil Search

Shell Oil Co. has abandoned K. C. L. No. 45-16 in Sec. 16-31s-26e in the Old River area. On formation test open one hour, the well showed a good to heading blow. Recovery was 6295 ft. of mud and water. Total depth is 11,500 ft. with plug at 7660 ft.

Middle Dome Test Drills

On the Middle Dome of Kettleman Hills, Standard of California continues to prospect ahead at a depth of 9810 ft. in No. 73-30V in Sec. 30-23s-19e. Present formation is hard sand and shale.

Sheep Springs Try Commences

The Texas Co. has staked location for a new explorer in the Sheep Springs area some 1650 ft. north and a like distance east from the southwest corner of Sec. 19-29s-21e, Kern County. It will be known as Anderson No. 36.

Cymric Test Now "No Dope"

Superior Oil Co.'s Woody No. 67-22 in Sec. 22-29s-21e in the Cymric field has graduated into the "no dope" category. When development information was last released hole was below 5100 ft. in Kreyenhagen shale.

Standard Oil Co. is rigging up Weston No. 71 in Sec. 27. Weston No. 33 in Sec. 26 is drilling below 4000 feet in shale, with the Oceanic sand the target. The Basal Etchegoin was wet on trial.

Oceanic No. 2, Independent Exploration follow-up to its new sand zone discovery, is making hole ahead in shale at 3600 ft. Site is in Sec. 22.

New Producer Added At Helm

Having completed its Dodini No. 38-14 in the Helm field flowing an unestimated amount of crude oil to sump, the Pacific Western-George F. Getty combination has started work on Dodini No. 16, located 1500 ft. north and 400 ft. east from the southwest corner of Sec. 14-17s-18e, Fresno County. Roads are being graded and cellar dug. Total depth is 7546 ft., with casing cemented at 7030 ft.

In the Miramonte area of Kern County, National Royalties No. 1 wildcat in Sec. 5-26s-22e is prospecting ahead below 4250 ft. Development information on the try is a company secret.

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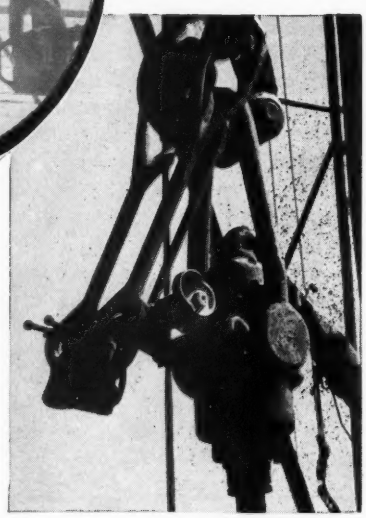

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Gilmour Completing Edison Area Wildcat

L. A. Gilmour, operator, is about to complete Neff No. 1 in Sec. 6-30s-29e in the Edison area, after cementing 7-in. casing at 4348 ft., which on test was effective. Total depth is 4644 ft.

Jacalitos Redrill Horizontal Project

An interesting redrill is under way in the Jacalitos area of Fresno County, sponsored by Wilshire Oil Co., which is rigging No. 27-23E in Sec. 23-21s-15e. Present depth is 3905 ft., with shut off at 3858 ft.

Intentions are to drill the well horizontally into the sand by the Zublin method for a distance of 50 to 60 ft.

New Cholame Test Starting

Henry E. Dawson, Los Angeles independent operator, has staked location for Dumplin No. 3 in Sec. 3-25s-15e in the Cholame area, San Luis Obispo County.

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Detroit Diesel Engine Issues New Bulletin

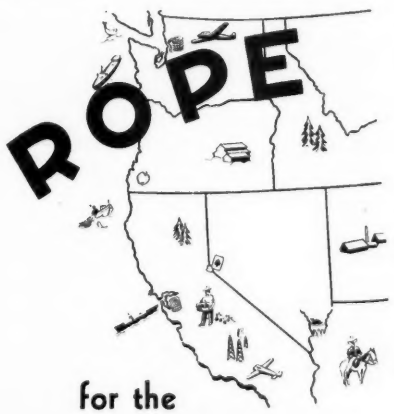
Detroit Diesel Engine Division of General Motors Corp. has just issued a special bulletin to the oil field trade, covering the General Motors oil field units.

This bulletin contains information which should be of interest to all branches of the oil industry, and will be sent upon request by writing to the company at Philtower, Tulsa, Okla.

HOLD

YOUR

BONDS



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California Oil World's Monthly Summary

DEVELOPMENT—PRODUCTION—SUPPLY & DEMAND
PACIFIC COAST TERRITORY
TABLE I—CALIFORNIA DEVELOPMENT—PRODUCTION

	NOVEMBER, 1945 DEVELOPMENT				PRODUCTION	
	Active Drilling Wells	Oil Wells Completed	Initial Production B/D	Oil Wells Completed First 11 Months	Daily Average November 1945	Daily Average November 1944
SAN JOAQUIN VALLEY						
Ant Hill	1	1	23	14	921	85
Antelope Hills	.....	.....	.....	4	1,703	2,187
Antelope Plains	.....	.....	.....	.....	.....	23
Arvin	.....	.....	.....	.....	49	32
Bellevue	.....	.....	.....	.....	490	810
Belridge—North	.....	.....	.....	7	5,384	6,877
Belridge—South	1	2	41	111	10,789	11,945
Blackwell's Corner	.....	.....	.....	6	249	364
Buena Vista Hills	1	2	454	138	40,777	27,166
Burrel	.....	.....	.....	.....	29	16
Canal	.....	.....	.....	.....	3,002	3,532
Canfield-Gosford	.....	.....	.....	1	136	176
Canfield Ranch	.....	.....	.....	.....	37	41
Coalinga—East	1	6	451	54	18,968	22,831
Coalinga—Nose	.....	.....	.....	2	53,156	62,009
Coalinga—West	.....	1	20	18	7,510	7,996
Coles Levee—North	.....	.....	.....	8	20,286	17,011
Coles Levee—South	1	1	203	8	2,055	
Edison	8	9	7,500	42	9,753	3,111
Elk Hills	8	3	257	213	14,247	34,774
Fruitvale	.....	1	24	9	8,075	8,655
Greeley	3	.....	.....	9	11,401	14,340
Helm	4	1	195	19	4,116	2,226
Jacalitos	2	1	63	26	4,011	1,155
Kern Front	7	2	86	36	12,378	13,902
Kern River	2	1	34	26	9,554	9,697
Kettleman North Dome	7	1	413	18	38,176	41,383
Lanare	2	3	494	11	1,104	168
Lost Hills	2	4	101	10	3,287	3,482
McClung	.....	.....	.....	.....	36	118
McKittrick	7	3	556	27	6,745	5,195
Midway-Sunset	2	6	377	51	38,057	40,852
Mountain View	.....	.....	.....	2	2,832	3,104
Mount Poso	6	1	17	22	17,753	20,882
Paloma	9	.....	.....	15	4,615	6,647
Pleasant Valley	1	.....	.....	4	3,598	3,562
Pyramid Hills	1	.....	.....	8	249	360
Race Track	.....	1	180	10	982	43
Raisin City	1	.....	.....	6	2,875	3,452
Rio Bravo	.....	.....	.....	.....	13,287	16,265
Riverdale	1	.....	.....	7	3,503	5,177
Rosedale Ranch	1	.....	.....	3	131	.....
Round Mountain	2	1	101	28	9,462	10,157
Santiago	3	1	4	4	1,080	.....
Shafter	.....	.....	.....	.....	.....	2
Sheep Springs	.....	.....	.....	3	472	284
Strand—East	.....	.....	.....	1	577	635
Strand—West	.....	.....	.....	.....	1,742	1,571
Tejon	3	1	109	11	456	194
Ten Section	.....	.....	.....	.....	9,673	11,739
Union Avenue	.....	1	200	1	32	74
Wasco	.....	.....	.....	.....	1,471	2,003
Wheeler Ridge	.....	.....	.....	.....	228	242
Miscellaneous	2	2	45	2	27	56
TOTAL SAN JOAQUIN VALLEY	89	56	11,498	995	401,526	428,608
COASTAL AREA						
Aliso Canyon	4	.....	.....	6	2,943	3,360
Bradley Canyon	.....	.....	.....	.....	.....	11
Capitan	2	1	413	7	1,140	2,615
Del Valle	.....	.....	.....	3	2,348	1,735
Elwood	1	.....	.....	5	6,057	5,731
Gato Ridge	1	.....	.....	6	4,024	4,784
Hasley Canyon	.....	.....	.....	.....	.....	.....
Newhall-Potrero	1	.....	.....	5	5,722	4,569
Oak Canyon	1	.....	.....	5	1,852	1,192
Oxnard	.....	.....	.....	2	1,088	938
Padre Canyon	.....	.....	.....	4	2,324	1,549
Ramona	.....	.....	.....	5	493	.....

MONTHLY SUMMARY—Continued	NOVEMBER, 1945 DEVELOPMENT				PRODUCTION	
	Active Drilling Wells	Oil Wells Completed	Initial Production B/D	Oil Wells Completed First 11 Months	Daily Average November 1945	Daily Average November 1944
Rincon	1	1	228	14	4,915	4,777
San Martinez	1	.....	.....	7	3,605	2,617
San Miguelito	3	.....	.....	4	4,667	6,031
Santa Barbara	.....	.....	.....	.....	97	82
Santa Maria	4	1	448	10	13,008	14,666
Santa Maria Valley	5	7	1,184	75	34,185	33,435
Summerland	.....	.....	.....	.....	.....	5
Ventura Avenue	8	4	2,130	46	47,142	47,210
Ventura-Newhall	6	1	135	38	6,551	5,407
Watsonville	.....	.....	.....	.....	25	25
Zaca Creek**	.....	.....	.....	.....	248	.....
Miscellaneous	.....	.....	.....	.....	.....	.....
TOTAL COASTAL AREA	38	15	4,538	242	142,434	140,739
LOS ANGELES BASIN						
Brea-Olinda	1	.....	.....	1	10,723	12,129
Buena Park	.....	.....	.....	.....	83	145
Coyote—East	2	1	46	6	4,851	5,199
Coyote—West	1	3	492	22	16,055	12,449
Dominguez	1	2	70	10	17,461	20,186
El Segundo	.....	.....	.....	.....	815	851
Huntington Beach	6	1	166	44	46,311	47,605
Inglewood	.....	.....	.....	1	14,257	16,679
Lawndale	.....	.....	.....	.....	18	29
Long Beach	2	1	10	2	26,305	28,896
Los Angeles-Salt Lake	.....	.....	.....	.....	498	451
Montebello	1	1	20	8	9,710	10,382
Newport-Costa Mesa	5	5	417	46	2,720	.....
Playa Del Rey	.....	.....	.....	.....	2,329	2,548
Potrero	.....	.....	.....	1	1,138	1,049
Richfield	2	1	37	12	7,642	7,088
Rosecrans	1	.....	.....	6	5,419	5,953
Sansinena	1	.....	.....	2	135	.....
Santa Fe Springs	.....	.....	.....	1	16,537	18,642
Seal Beach	3	.....	.....	15	9,153	8,429
Torrance	2	2	90	43	8,853	8,052
Turnbull Canyon	.....	.....	.....	.....	169	213
Whittier	.....	.....	.....	3	973	1,036
Wilmington	14	17	2,033	133	95,482	99,975
Yorba Linda	.....	.....	.....	.....	.....	730
Miscellaneous	.....	.....	.....	.....	.....	.....
TOTAL LOS ANGELES BASIN	42	34	3,381	356	297,637	308,716
EXPLORATORY						
Outpost Wells	32	.....	.....	.....	.....	.....
Wildcats	21	.....	.....	.....	.....	.....
Gas Wells	8	5	.....	51	.....	.....
TOTAL CALIFORNIA	230	110	19,867	2,017*	841,597	878,063

*—Includes gas wells completed and 373 wells abandoned.
**—Formerly included with Santa Maria.

TABLE II—SUPPLY AND DEMAND FOR PETROLEUM PRODUCTS
PACIFIC COAST TERRITORY
DATA FOR NOVEMBER OF EACH YEAR

	November 1940	November 1941	November 1942	November 1943	November 1944	November 1945
RAW MATERIAL—B/D						
1. Crude Oil Produced—California	607,700	650,552	727,598	793,959	878,063	841,597
2. Crude Oil from outside 5 Western States	1,533	2,616	3,902	5,041	4,870	3,170
3. Natural Gasoline Produced	39,000	38,000	36,000	38,000	41,000	41,000
SUPPLY OF FINISHED PRODUCTS						
ALL SOURCES—B/D						
4. Natural Gas., L.P.G. & Condensate	7,367	9,867	7,800	11,634	14,700	22,033
5. Gasoline and Naphtha Distillates	222,167	250,367	258,233	260,367	337,867	299,133
6. Kerosene and Kerosene Distillates	12,133	6,733	4,933	8,967	9,267	9,667
7. Lubricating Oils, etc.	14,733	8,967	13,734	14,667	14,733	13,300
8. Gas Oil and Diesel Oil	72,933	64,100	67,533	61,267	67,533	75,467
9. Fuel Oil Residuum	251,800	284,333	397,700	438,100	473,133	396,167
10. Asphalt and Road Oils	7,700	22,567	32,300	25,133	22,067	17,033
11. Coke and Other Finished Products	1,700	3,833	767	1,433	3,267	1,634
12. Other Unfinished Oils	100	(6,067)	(567)	1,033	(600)	1,100
13. Refinery Shortage and Gas	23,533	21,200	27,765	31,300	47,632	35,500
14. Crude Oil (Net)	39,367	35,100	(30,033)	4,533	(28,000)	39,566
15. TOTAL SUPPLY	**653,533**	**701,000**	**780,165**	**858,434**	**961,599**	**910,600**
16. TOTAL DEMAND	**725,667**	**689,833**	**821,499**	**961,567**	**991,899**	**901,365**
17. DIFFERENCE	**(72,134)**	**11,167**	**41,334**	**(103,133)**	**(30,300)**	**9,235**
18. Stocks on hand End of each month (Total Bbls.)	**151,419,000**	**141,872,000**	**129,257,000**	**107,699,000**	**92,680,000**	**76,679,000**

Coastal and Northern District

Run Junk Basket In Tapo Canyon Try

Having successfully recovered all fish but one cone, Wilshire Oil Co. is running junk basket in its N. L. & F. No. 1 in Sec. 2-3n-18w at Tapo Canyon. Total depth is 3621 ft.

Sta. Maria Edge Well In Knoxville

On the north edge of Santa Maria Valley field production, General Petroleum Corp. is making headway below 4400 ft. in Knoxville sandstone in its Tognazzini No. 1 in Sec. 20-10n-34w, Santa Barbara County. The Knoxville was reached slightly below 4100 ft.

Hopper Creek Try Drills On

Union Oil Co.'s Moran No. 1 wildcat in Sec. 1-4n-19w in the Hopper Creek area is exploring ahead below 5200 ft. Before the drill could start at this location, construction of three miles of curving road was necessary.

Modelo Field Well Prepares To Pump

Pacific Western Oil Corp.'s Crocker Fee No. 1-D deep test of the Modelo field in Sec. 7-4n-18w, which found nothing of interest in the lower formations, is being prepared for the pump, after the hole was plugged back to 1230 ft. Total depth is 10,504 ft.

Bel-Air Drills At Casmalia Field

Bel-Air Oil Co.'s scheduled deep try of the Casmalia field, Arellanes No. 2 in Sec. 13-9n-35w, is making steady progress below 2250 ft.

New Work Listed For Conejo Test

Sanborn Petroleum Co. of Utah has taken over Janss No. 1 in Sec. 33-2n-19w, with the intention of running pipe and making a try for completion. The hole is bottomed at 5360 ft. Former operator was Pacific Oil and Investors.

Wildcat Opens New Gas Field

Shell Oil Co., Inc., evidently has chalked up an important gas discovery in the Winters area of Solano County. Its McCune No. 1 in Sec. 29-8n-1e on test produced an estimated 6,000,000 cubic ft. of natural gas daily. Original bottom is 5528 ft., with plug at 5240 feet. Interval open to production is 5209-5239 ft.

Located six miles east of the town of Winters and about the same distance southwest of several gas wells in Yolo County, Shell holds 7000 acres of land contiguous to the test in Solano County and across the line in Yolo County. The acreage is only 30 miles north of the Shell Chemical Corp. plant at Shell Point, and 30 miles northwest of Sacramento County.

Standard Completes Gas Well

Standard Oil Co., Jordan Unit No. 3 in Sec. 29-3n-3e in the Rio Vista field has been completed at 4245 ft. for a yield of 4,048,000 ft. of gas. Now shut in, the project reached the Nortonville at 3785 ft., and the Domengine at 4217 ft.

Monterey County Scene of New Try

Chanslor-Canfield-Midway Oil Co. is rigging derrick to start the drill in its Salanco No. 1 wildcat in Sec. 35-19s-7e in the King City area of Monterey County, not far from the California seat of government during the days of the Spanish Dons. The well site is on the Rancho Poso de Los Ositos.

Ojai Test Starting

Trans-Cal Gas & Oil Corp. is rigging up its No. 1 exploratory venture in the Ojai area of Ventura County in Sec. 12-4n-22w. In Sec. 7, Volunteer Petroleum is swabbing a small amount of muddy water from its Hilltop No. 2, plugged at 4500 ft. Hilltop No. 1 is idle at 245 ft., and Pyramid No. 1 inactive at 35 ft.

Piru Try May Rerig

C. W. Ginter & Associates, Warring No. 1 in Sec. 19-4n-19w in the Piru area, which recently was reported abandoned at a total depth of 1480 ft., may be rerigged and operations resumed to carry the hole deeper for a look at lower formations.

Timber Canyon Try Fishing Pipe

In the Timber Canyon sector, Ventura County, Standard Oil Co. is fishing drill pipe in Andrews-Toland No. 1 in Sec. 18-4n-20w, with hole bottomed at 7425 ft. Santa Paula Unit No. 1 in Sec. 10 is drilling below 10,400 ft.

Red Mountain Try Progressing

Continental Oil Co., Casitas No. 2 test in Sec. 7-3n-23w continues to prospect steadily ahead at 3850 ft. in sand and shale. It is located in the Red Mountain area.

General Drilling Co.

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THIS LAUGH OFF!!

Some Alaskan sourdoughs were telling bear stories. Starting with the little Malayan honey bear they worked up to the savage brown monarch of Alaska, the stories growing with the size of the bear. This one stopped them all: "I was huntin' caribou when a two-ton brownie riz up and come at me. I wounded him enough to make him mad; then my rifle jammed an' I headed for the nearest tree, two miles away. Didn't have much hope because that tree only had one limb an' that was 30 feet up the trunk. Well, I got there a foot ahead o' the b'ar; as I gathered myself for the leap he made a dab at me. Tore my britches off but didn't quite reach me. However, he scairt me so I missed the limb."

Silence, then: "What happened?"

"I caught it on the way down."

A certain old lady had a recurring nightmare in which a young man pursued her with intentions obviously dishonorable.

She consulted a physician, told him about the dreams, and was given some medicine to make her sleep better.

In a few days she was back again.

"Now, now," said the doctor. "Don't tell me you still don't sleep well."

"Oh, no, it isn't that, doctor. But to tell the truth, I certainly do miss that young man."

A male nurse in a mental hospital noticed a patient with his ear close to the wall, listening intently. The patient held up a finger as a warning for him to be very quiet; then beckoned him over and said: "You listen here."

The nurse put his ear to the wall and listened for some time, then turned to the patient and said: "I can't hear anything."

"No," said the patient, "and it's been like that all day."

To a companion a colored soldier thus explained jujitsu: "It's jes' a mean, low-down kind of wrasslin' you might know a Jap'd think up. When you gits t' close infightin,' you exten's the glad hand o' fellowship t' the enemy, and whilest yo' is shakin' hands yo' sprains his ankle, so he cain't run whilest yo' breaks his neck."

A man wags his tongue and a dog wags his tail, but the dog's wag is always truthful.

The young woman carried her baby with her when she went to the fortune teller. He started reeling off things about the future of the child, but she cut him short saying, "Never mind that. Just see if you can find out where I was during that special blackout last year."

The scene was in the courtroom of the hills of the South. The young lawyer was handling old Colonel Pickett unmercifully, and the colonel was getting hot under the collar.

"What," shouted the young lawyer, "were you Colonel of, any way?"

"The old Colonel answered, evasively, "Oh, I reckon it was the hog brigade."

The sailor playing left field missed three easy flies. Returning to the dugout he explained to the athletic officer: "I guess I'll have to get some glasses."

"Glasses!" roared the officer. "You're too far gone for glasses! What you need is radar."

The courtroom was crowded as the judge finished his lecture to the defendant in a divorce action.

"So I've decided to give your wife $40 per month," were his last words.

"That's fine, judge," the husband said as his face lit up with a big smile. "I'll try to slip her a couple of bucks now and then, myself."

Hank: Sorry, old man, that my hen got loose and scratched up your garden.

Zeb: That's all right—my dog ate your hen.

Hank: Fine. I just ran over your dog and killed him.

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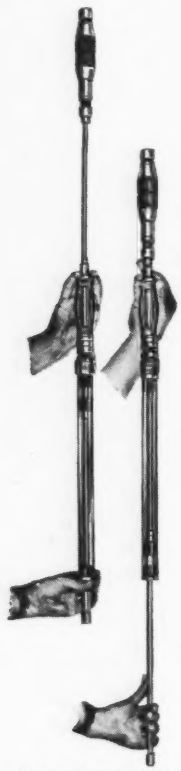
Simplified Model Speeds Up Interviews



At left, demonstrating washer at top of filling stroke; at right, bottom of pressure, or washing stroke.

The experience of the McGaffey-Taylor Corporation points a way for other companies faced with the same difficulty—that of demonstrating equipment whose actual operation cannot be observed. In interview after interview, McGaffey-Taylor found that the two most difficult to make clear were precisely the two most important features of their pressure washer . . . one, that the packers could be placed as close together as ¼" for greater pressure, and two, that the packer assembly moved with the piston the entire length of its stroke. The simplified model shown here was the solution.

The glass barrel represents the cylinder; below it are the belly spring and the slips which hold the washer at the desired place in the well. The black "grip" in the handle-like piece shows how closely the packers can be spaced. The size of the model, which is in two pieces for easy carrying, can be gauged by its relation to the hands.

With these models, McGaffey-Taylor report, it is easy to show and explain the action of the pressure washer . . . that the washer itself remains stationary, the washing fluid traveling from the cylinder down **through** the lower rod and out with great force between the close-set packers which travel with the piston. Results of interviews where such demonstrations have been made are uniformly excellent.

While the cost of demonstrating models may be, in some cases, quite high, McGaffey-Taylor's experience with them indicates that the results obtained from their use as sales aids amply justifies their expense in a great majority of cases.

Patterson-Ballagh Sucker Rod Wipers

Patterson-Ballagh's Sucker Rod Wipers are made in two styles, the regular Universal Style and the Paraffine Remover Style. These wipers offer effective means of completely stripping the rods of oil and muck, no matter how sticky. Both are completely housed and are practically automatic in operation. Each model is available with either plain head or safety cap style head. Release of these heads is easily accomplished by loosening the hammer nuts, allowing the eye bolts to swing free, permitting instant removal.

New Sucker Rod Wiper "SUBORN"

The wiping is done by self aligning reinforced discs of tough, wear-resisting, PBX Synthetic Rubber. The discs are made in four sizes for wiping 5/8", ¾", 7/8" and 1" rods. Bodies are cast steel. There is nothing to wear except the easily replaced PBX Synthetic Rubber Wiper.

The Paraffine Remover Style illustrated above has two side outlets for the discharge of excess paraffine, removed by the special cone shaped refill that is located just at the junction of the two outlets.

Patterson-Ballagh Sucker Rod Wipers are time and money savers and mean cleaner production.

Republic Drill & Tool Appoints Petroleum Equipment

The Republic Drill & Tool Company of Chicago announced recently through the Chairman of their Board of Directors, Clarence Avildsen, the appointment of Petroleum Equipment Company as the distributor of their products as used by the Oil Industry. The Petroleum Equipment Company has a complete stock of Republic twist drills on hand in their Los Angeles and San Francisco warehouses, as well as in all their conveniently located field stores.

The high quality of product which has made Republic Drill & Tool the world's largest exclusive manufacturer of twist drills is well matched in the outstanding record of Petroleum Equipment Company's service to the oil industry.

Chicago Bridge Issues New Booklet

Publication of a new six-page booklet, "The Hortonsphere," has been announced by the Chicago Bridge & Iron Company, Chicago, Illinois. The booklet describes the reduction of evaporation losses from highly volatile liquids by storing them under pressure in Hortonspheres. The correct storage pressure required to prevent standing losses from volatile liquids can be read directly from the chart shown in this booklet. Included is a standard capacity table showing the operating pressures available for each size. Gauging methods are described and photographs of three typical gauging units are shown. A copy of the booklet will be sent on request.

Assistant Micro-Paleontologist

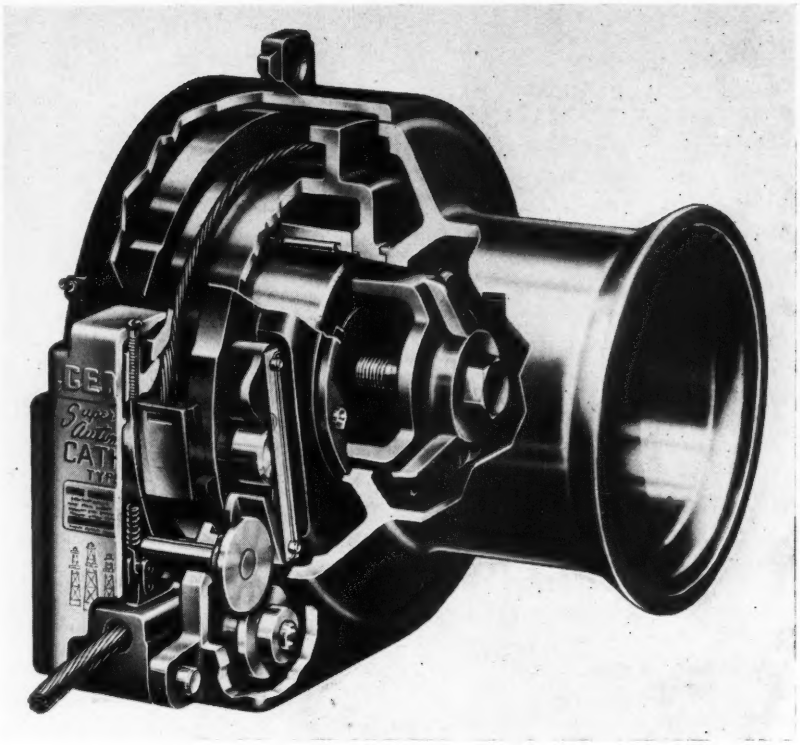
Stratigraphic correlation of well and surface samples. Degree 3 or 4 yrs. experience. South American assigment. Preferably unencumbered. The Atlantic Refining Co., P.O. Box 7258, Philadelphia, Pa. 1/20b

BUY U. S. SAVINGS BONDS

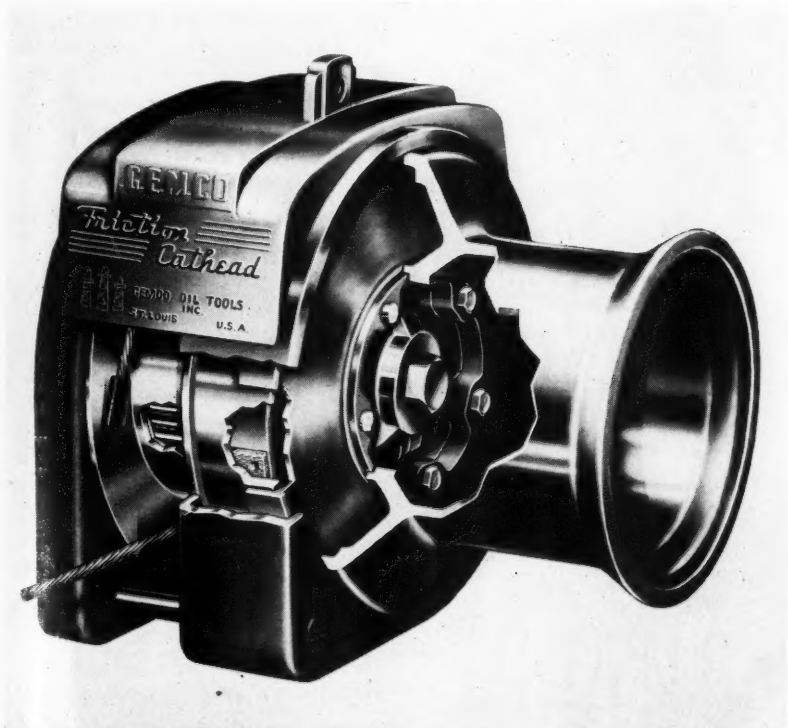
GEMCO Announce Complete New Line of Catheads

Gemco Oil Tools has recently developed and is now in production on a complete line of new and improved Breakout and Spinning Catheads that will set a new standard in oil fields for safety, efficiency, convenience and low maintenance cost. The line consists of a super automatic positive clutch type Breakout Cathead, a plain automatic positive clutch type Breakout Cathead and a (3 in 1) friction clutch type Breakout, Spinning and Combination Make & Break Cathead and features many scientific engineering developments offered to the industry for the first time.

Each of the three different types is built around a common base assembly consisting of shaft adapter for adapting to any size or type lineshaft, adapter retainer, roller bearings and spool. On this base assembly may be mounted any one of the different Cathead units, thus permitting complete interchangeability of all types. The base assembly is also a complete unit within itself and may be used independently without the Cathead unit when doing work requiring only a spool.



Model A-5 Super Automatic Breakout.



Model B-5 3-in-1 Friction Breakout and Spinning Cathead.

Installation has been simplified by the use of a standard anchor for all models. Quick, accurate location is now possible by means of a simple fixture. The anchor also serves as a mounting for optional hydraulic, pneumatic, steam or mechanical operating control. Cathead may be removed from line shaft without disturbing either the anchor or operating controls.

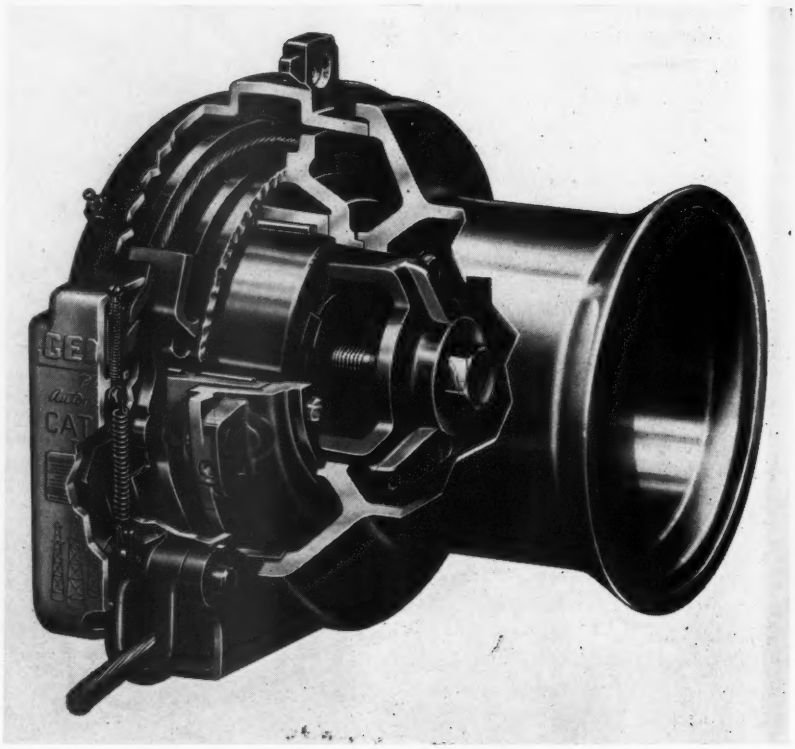
The 3 in 1 friction clutch type may be mounted and will operate with equal efficiency on either side of the drawworks and when mounted may be changed from Breakout to Spinner or vice versa by changing only the line. It employs an internal expanding friction clutch that requires no adjustments. Has no thrust bearings or toggles to wear.

The Super Automatic positive clutch type employs the same principle that has made Gemco Catheads popular throughout the world since 1937, but now vastly improved to insure smoother operation, greater safety and lower maintenance cost. New safety jerkline shoe can now be removed from grooved drum and replaced in a jiffy without the

aid of tools. New ratchet type operating mechanism prevents repeat operations even though the operating lever is not released by the operator. No accidental engagement or disengagement is possible.

The Plain Automatic is designed to fill a need for a low cost utility unit. It has the lowest jerkline speed of any Cathead of this type. It employs hard alloy steel engaging shoulders that are inexpensive and easily replaced. No welding of worn drum shoulders is necessary. Shoe is disengaged by a cam from underneath that forces the shoe upward, thus eliminating heavy impacts. Shoe is locked in disengaging position when not in use.

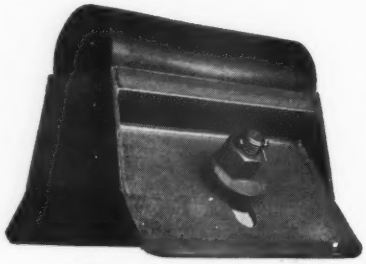
Gemco Catheads for 1946 are the result of many years of engineering research and development. Many new and exclusive features contribute to their finer performance, greater safety and unparalleled economy. All models are fully interchangeable and may be changed from one shaft to another in the same manner that you change a tire on your automobile from one position to another.



Model C-5 Plain Automatic Breakout

Patterson-Ballagh Traveling Block Bumper

A shock absorbing bumper for installation on top of traveling block. A thick cylinder of PBX absorbs the shock should the block be inadvertently pulled into the crown. This is especially important in the portable, or "blitz" rig, where the driller is unable to see the crown block from his station. The framework is a steel assembly bolted to the traveling block for which it is made. The rubber bumpers are of large diameter and cover the whole face of the block. The rubbers are made in sections, and are firmly attached to the frame by a bar that extends inside the full length of the bumpers, and have a number of bolts attached thereto so that, regardless of the violence of the blow, the rubbers cannot fall. One accident will pay for all the bumpers that would be used for many years. Refills are easily replaceable. Deliveries can be made for bumpers for most styles of Regan, Oil Well, Emsco, Baash-Ross, Nasco, Ideal, Ideco, and others.



Traveling Block Bumper

The illustration above shows the Patterson-Ballagh Traveling Block Bumper Code JAY, mounted on an Emsco M-5 Block. Length 20 inches, weight 210 pounds.

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440 acres proven oil land at the forks of Sespe Canyon, four miles north of Fillmore, Ventura Co. Producing wells on 3 sides of property, roads, pipelines, water and power available. P. L. Bonebrake, 180 Santa Anita Court, Sierra Madre, Calif. Phone: CUmberland 5-4772. 3/5b

BUY U. S. SAVINGS BONDS

Joint Meeting Between C.N.G.A. and Purchasing Men

Members of the California Natural Gasoline Association will hold a joint meeting on Thursday February 7, at Rio Hondo Golf Club, with the Petroleum group of the Purchasing Agents Association.

Purposes of the joint meeting according to M. L. Arnold, President of C.N.G.A. will be to afford an opportunity for members of the two groups to become better acquainted; to promote a better understanding of the problems and objectives of the operating and purchasing departments; and to discuss means whereby the two departments can more effectively cooperate in obtaining the materials, equipment and services required by the industry.

Three speakers from each group will be chosen to discuss selected topics of mutual interest.

Already a great deal of interest is being shown in this unique get together being planned between the oil company engineers and the purchasing agents.

Manufactured with the pride of craftsmanship resulting from 106 years of experience in meeting the exacting needs of our customers.

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SPANG · CHALFANT

DIVISION OF THE NATIONAL SUPPLY COMPANY

Magruder Elected Vice Pres. of G. P.

Philip S. Magruder, manager of manufacturing of General Petroleum Corporation, has been elected vice-president of the company. The announcement was made in Los Angeles by S. J. Dickey, president.

P. S. Magruder

This latest advancement highlights a brilliant career for Magruder, who joined General in 1925 as gas tester. Soon he was promoted to gas engineer, and later to the superintendency of the gas department. In 1942 he was advanced to manager of that department. Last fall he was elected to the board of directors and appointed head of the manufacturing department, which position he still holds.

General's new vice president is a native of Wichita Falls, Texas, and has lived most of his life in and near the oil fields. He has always been closely identified with the natural gas and gasoline industries.

One of the organizers of the California Natural Gasoline Association, he served as chairman of its technical committee in 1933-35. He became vice president of the association in 1936-39, and president in 1939-40. Currently he is a member of the association's executive committee.

Earl Rees Joins Patterson-Ballagh

Patterson - Ballagh recently announced the association of Earl Rees with their firm.

He has spent most of his working life in the oil tool business, where he has had a varied experience. His past associations have been with Republic Supply Company of California, Fluid Packed Pump Company, and Oil Well Manufacturing Company, occupying various positions from salesman to export manager and sales manager. The past four years have been spent with the United States Marine Corps, during which time he served as a captain, stationed at San Diego Marine Base and later at the Naval Ammunition Depot at Hawthorne, Nevada.

Earl will represent Patterson-Ballagh throughout the State of California, spending a great deal of his time on the company's production items which includes the new Swab recently introduced to the trade. He will make his headquarters at Patterson-Ballagh's office and factory at Los Angeles.

T. K. Sawyer

T. K. Sawyer Advanced by Schlumberger

A. A. Perebinossoff, California Division Manager of Schlumberger Well Surveying Corporation, announces that the company is resuming its gun perforating service in the San Joaquin Valley of California. Mr. T. K. (Ted) Sawyer, for many years with Schlumberger, has been appointed Technical Assistant in charge of gun perforating. He will continue to make his headquarters in Bakersfield.

Cort Advanced by Bethlehem

Announcement of the appointment of Stewart S. Cort as Manager of Sheet and Tin Plate Sales was made recently by the Bethlehem Pacific Coast Steel Corporation.

Mr. Cort, a graduate of Yale University and the Harvard Graduate School of Business Administration, had a year's sales experience with the Reynolds Metals Company before starting to work in Bethlehem Steel Company's Commercial Research Dept. in 1937. He was made Supervisor of commercial research for Bethlehem's Pacific Coast Steel operations in 1939, and when the war started became Manager of Scheduling for Bethlehem's West Coast mills.

For the past year, Mr. Cort has been in the Sheet and Tin Plate Sales Department at Bethlehem, Pennsylvania. His recent return to the Coast to become the first Manager of this division of sales for Bethlehem Pacific is an indication of the company's outlook for future sales of sheet and tin plate products in the West.

Parker Advanced by Standard

Raymond W. Parker has been appointed chief engineer of Standard of California's manufacturing department's San Francisco headquarters.

During the war Parker handled the engineering phase of all the major refinery construction projects for Standard's manufacturing department.

RENTALS

By The Manufacturer

VERNON-CORWIN DESANDERS

VERNON-McNEELY VIBRATING MUD SCREENS

VERNON TOOL CO., LTD.

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Practical Refrigeration

(Continued from Page 15)

most economical means of securing additional plant capacity in existing plants. Experience has shown that the problems of operating and maintaining a refrigeration plant are extremely few and of minor importance. It also indicates that no unusual hazards result from the use of propane refrigerant. It is believed that practically any plant can develop a supply of propane at very small cost that will prove acceptable as a refrigerant for this type of operation. Although papers have been presented in the past dealing with the advantages of propane refrigeration, their value has apparently not been fully appreciated. It is hoped that the presentation of this information on a practical rather than a more theoretical basis will prove the key necessary to open the door to a more general acceptance of this type of installation, which we feel to be justified on a practical and economical basis.

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Nomads 7th Annual Inaugural Dance on February 16th

February 16 is the time selected for the seventh annual Inaugural Dinner Dance of the Los Angeles Chapter of NOMADS. This year, as last, the ballroom of the Biltmore Hotel has been reserved for NOMAD members and guests.

The Inaugural honors the new as well as the retiring officers of the Chapter and a larger attendance is expected than at any previous party.

New officers elected for 1946 are as follows:

President—Wilbur F. Bettis.

Vice President—J. V. Robinson.

Secretary—Earl M. Daniels.

Treasurer—William McGraw.

Sergeant-at-Arms — Wallace A. Sawdon.

Assistant Secretary — B. M. Landis.

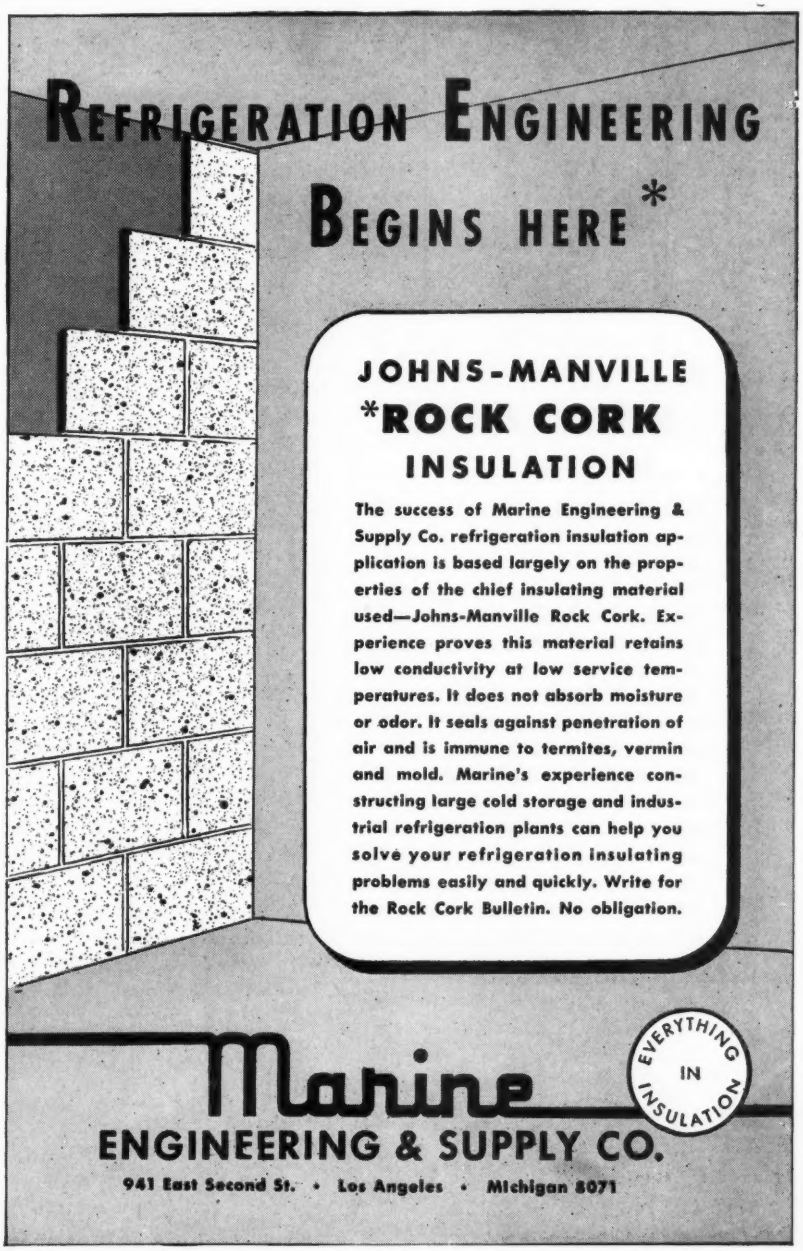
Assistant Treasurer—Tom Martin.

Deputy Sergeant-at-Arms — Dan Duncan.

Regents: Roland Smith, Ted Sutter.

According to Elmer Smith, Chapter President, plans will provide for handling a maximum of 400 people. NOMADS planning to attend with or without guests are urged to make early reservations. Cocktails will be served from 6:30 to 8:00, dinner at 8:00, and entertainment has been provided.

Victor Indig is now Factory Export Sales Representative for Lane-Wells, Patterson Ballagh, Overstrom & Sons, and Commercial Iron Works. During war he was with Navy Bureau of Supplies. Vic was with Standard for 20 years.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INSULATION
The success of Marine Engineering & Supply Co. refrigeration insulation application is based largely on the properties of the chief insulating material used—Johns-Manville Rock Cork. Experience proves this material retains low conductivity at low service temperatures. It does not absorb moisture or odor. It seals against penetration of air and is immune to termites, vermin and mold. Marine's experience constructing large cold storage and industrial refrigeration plants can help you solve your refrigeration insulating problems easily and quickly. Write for the Rock Cork Bulletin. No obligation.
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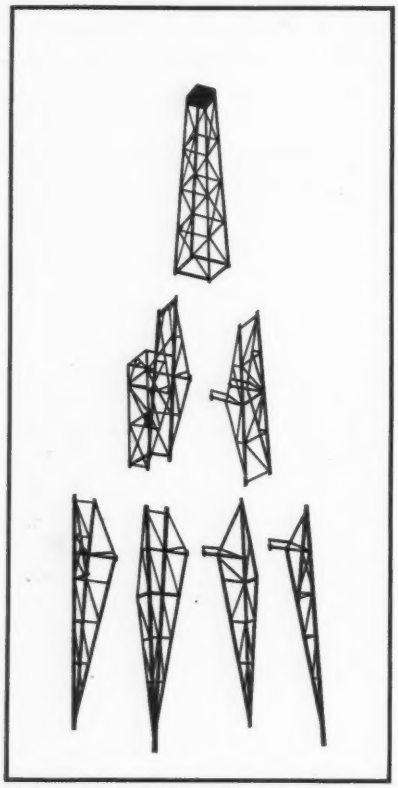
New Portable Mast

(Continued from Page 26)



The 7 sub-assemblies making up the smaller type of mast are here shown.

working platform places the derrick man in front of the setback with one foot on each board. Rigid racking fingers clamp separately to beam girts for adjustment in spacing and are hinged to permit folding against the derrick face. The platform is hinged and ladders for full height of the mast are pivoted to fold flat against the mast during transportation. Unitized substructures of two heights and in lengths to fit the rig can be furnished. Casing racks have been designed for use with either size mast or can be designed to specification.

Washington Highlights

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posed to Kenny, and incidentally to Pauley. This group is expected to fight all attempts made by the state of California to retain title to the lands.

However, sponsors of the bill feel confident that the legislation will receive Senate approval, but they are nevertheless working for an overwhelming majority for its passage, since there is every indication that President Truman will veto the measure when it comes to him for his signature, because he directed the Justice Department to file suit on the question in the Supreme Court.

If the pending legislation should become law over President Truman's veto, it would automatically put a finish to the litigation before the Supreme Court, since there would be no way for the government to bring the law before it for an opinion on constitutional grounds. Congress has the complete power to make an outright grant of public lands, and the government's entire case rests on the premise that tidelands are public lands rather than state lands. Should the bill fail to become law, however, the battle is almost certain to go on in the Supreme Court throughout the Spring, and quite possibly longer.

While a decision in the California case would have no effect on other states with oil deposits in their tidelands, such as Texas and Louisiana, both of which boast rich oil lands offshore, it would be almost a certainty that if the court should reverse previous decisions and rule in favor of the Federal government in the California case, that suits would be immediately instituted against the other coastal states.

In the event that the Federal government should win the case and suits were instituted against other states there is a possibility that different decisions would be reached by the courts. Both Texas and Louisiana have long contended that their claims to the submerged lands are on a different basis from that of California.

Texas was an independent republic before it became a state as the result of a treaty with the United States. It is the only state which is now a member of the United States which did this.

While most states were required to deed a certain amount of land to the Federal government as part of the state's obligation in entering the Union, there was a specific provision in the treaty with the Republic of Texas which reserved the title to all Texas lands in the state. This is the basis for the contention of that state.

In the case of Louisiana, it was acquired as a part of the Louisiana purchase from France and the state's claim to its tidelands is based on this purchase and its conditions. California was seized from Mexico and the other two main oil-producing states contend that this puts that state in a different category.

The appointment of Pauley as Undersecretary and presumptive Secretary-to-be of the Navy when the present Secretary James V. Forrestal steps out sometime in the next few months, roused a wave of criticism in Washington. Pauley is currently serving as United States reparations commissioner for Japan, following similar service in Germany.

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